
HAND HELD PRODUCTS

Dolphin™ 7200 Handheld Computer and HomeBase™ User's Guide

7200/UG Rev. C



Copyright

Copyright © March 2001 Hand Held Products. All rights reserved.

Portions of the software described in this document copyright © Microsoft Corporation. All Rights Reserved.

Information in this document is subject to change without notice. The software described in this document is furnished under a license agreement. The software may be used or copied only in accordance with the terms of this agreement. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or any means electronic or mechanical, including photocopying and recording for any purpose other than the purchaser's personal use without written permission of Hand Held Products.

Trademarks

Microsoft, Windows 3.11, Windows 95 and Windows NT and Excel are trademarks or registered trademarks of Microsoft Corporation. Spreadsheet Simplicity, Dolphin, Dolphin RF and HomeBase are trademarks or registered trademarks of Hand Held Products. Patents are pending for Spreadsheet Simplicity. iButton is a trademark of Dallas Semiconductor. Other product names mentioned in this document may be trademarks or registered trademarks of their respective companies and are hereby acknowledged.

Printed in U.S.A

Contacting Hand Held Products

Offices Serving North America

Skaneateles Falls, NY

Tel: (315) 685-8945

Fax: (315) 685-3172

Charlotte, NC

Tel: (704) 537-1444

Fax: (704) 532-4191

Offices Serving Europe, Middle East, and Africa

Europe

Tel: Int+31-40 24 24 486

Fax: Int+31-40 24 25 672

United Kingdom

Tel: Int +44 (0) 1 925 240055

Fax: Int +44 (0) 1 925 631280

France

Tel: Int +33(0) 1 461 04111

Fax: Int +33(0) 1 461 04120

Germany

Tel: Int +49 (0) 7 447 151377

Fax: Int +49 (0) 7 447 151378

Offices Serving Asia and the Pacific Rim

Hong Kong

Tel: Int +852 2511 3050/2511

3132

Fax: Int +852 2511 3557

Japan

Tel: Int +813 52127392

Fax: Int +813 32617372

Offices Serving Latin America

Naples, Florida

Tel: (941) 263-7600

Fax: (941) 263-9689

Table of Contents

Before You Begin	7
Welcome	7
Safety	8
Required Safety Labels	8
RF Energy	10
Statement of Agency Compliance	10
FCC Class B Compliance Statement	10
Canadian Notice	11
CDRH Laser Safety Statement	11
EN 60825-1 Laser Safety Statement	11
R&TTE Directive	11
Regulatory and Safety Agency Approvals	12
Interference	12
Batteries	13
Care and Cleaning of the Dolphin	13
Chapter 1 Getting Started	14
About the Dolphin 7200 Handheld Computer	15
Accessories for the Dolphin	15
Dolphin 7200 Models and Options	16
Bar Code Symbolologies Supported	17
Using Dolphin for the First Time	18
1 Checking Your Package	18
2 Charging the Battery	18
3 Turning the Dolphin On And Off	20
4 Setting the Date and Time	20
Chapter 2 Dolphin Basics	22
System Features	23
CPU	23
Disk Drives	23
Front Panel Physical Features	23
Light Emitting Diodes (LED)	23
Liquid Crystal Display (LCD)	24
Speaker	24
RF Antenna	24
Using the Alphanumeric Keypad	25
Key Combinations For Keypad Functions and Special Characters	26
Using the Numeric Keypad	27
Key Combinations For Keypad Functions and Special Characters	28
Entering Alpha and Special Characters	28
Display Symbols	29
Battery Charge	29
Keyboard Mode	29
Back Panel Features	31
Laser Engine	31
Laser Engine	32

Image Engine	32
Lanyard Eyelet for Optional Wrist Strap	32
Battery Well.....	32
Reset Switch	32
Maintaining the Dolphin's Batteries.....	33
Internal NiMH Backup Battery.....	33
NiMH Battery Pack	34
Storing Batteries	35
Chapter 3 Dolphin® 7200 RF Handheld Computer	36
About the Dolphin 7200 RF Handheld Computer.....	37
802.11b-Compliant Dolphin 7200 RF Terminal.....	37
Configuring Your 802.11b- Compliant Dolphin 7200 RF Terminal	38
WLIF™-Compliant Dolphin 7200 RF Terminal	50
Dolphin 7200 RF Peripherals	53
Host Connectivity	54
Terminal Emulation Keyboard Overlays	56
Chapter 4 Dolphin™ 7200 with iButton Reader Handheld Computer	58
About Dolphin with iButton Reader Handheld Computer	59
What is an iButton?	59
Working with iButtons	60
iButtons supported by Dolphin with iButton Reader.....	60
Developing Applications with Dolphin with iButton Reader	61
Chapter 5 Dolphin™ 7200 with Image-Capture Handheld Computer	62
About Dolphin 7200 with Image-Capture™ Handheld Computer.....	63
Capturing Images.....	63
Lighting Conditions	65
Dolphin Image-Capture Demo Software	65
Installing the Dolphin Image Capture Demo Software on the Host.....	66
Dolphin Image-Capture Client Demonstration Software	73
Chapter 6 Dolphin 7200 2D Terminal	81
About the Dolphin 7200 2D Hand Held Computer	81
About the Dolphin 7200 2D Hand Held Computer	82
Supported Symbologies.....	82
Capturing Images.....	84
Lighting Conditions	84
Dolphin 7200 2D Demo Software	85
Installing the Dolphin 7200 2D Demo Software on the Host	85
Installing the Dolphin 7200 2D Demo Software on the Dolphin Terminal	85
Chapter 7 Using the Dolphin 7200 HomeBase.....	93

Hub of the System	94
Dolphin 7200 HomeBase Parts and Functions	95
Charging Batteries In The Dolphin 7200 HomeBase	97
Charging Batteries In The Dolphin 7200 HomeBase	98
Setting Up For Communications	100
Setting up the Dolphin HomeBase	100
Configuring a Single Dolphin 7200 HomeBase.....	103
Creating a Dolphin 7200 HomeBase Network.....	104
Communicating with the Dolphin Terminal.....	108
Chapter 8 Using the Dolphin 7200 Compact HomeBase.....	109
Hub of the System	110
Dolphin 7200 Compact HomeBase Parts and Functions.....	111
Powering the Dolphin Terminal.....	113
Mounting the Dolphin 7200 Compact HomeBase	115
Setting Up For Communications	117
Setting up the Dolphin Compact HomeBase	117
Communicating with the Dolphin Terminal.....	119
Chapter 9 Learning About the Dolphin OS and Development	
System Software.....	120
Dolphin OS and Development System.....	121
Installation	121
Help File, Document and Utility Icons	123
Dolphin HHP Demo Program.....	124
Scanning A Barcode	128
Dolphin Utilities	129
Dolphin Application Development.....	134
Compiling Applications for the Dolphin.....	134
Sample Applications.....	135
Building the Samples	135
Compiling the Sample Programs	136
Transferring Files to or from Dolphin	137
Using the YX.EXE Utility	137
Using the Dolphin File Transfer Program.....	137
Dolphin EVS Engine	140
Dolphin ROM Image and Boot Loader	142
Upgrading the Dolphin ROM Image	142
Upgrading the Dolphin Boot Loader	143
Chapter 10 Troubleshooting and Warranty Information	
Dolphin 7200 Terminal	144
Just In Case.....	145
Before Calling For Technical Support.....	145
Troubleshooting the Dolphin Terminal and HomeBase	145

Warranty Information	152
Who Is Covered By The Warranty	152
What's Covered By The Warranty	152
What's Not Covered By The Warranty	153
How Problems Should Be Handled	153
Return Information	153
How To Extend Your Warranty.....	155
Technical Support.....	155
Appendix A Dolphin 7200 Terminal Specifications.....	156
Appendix B Bar Code Samples.....	168
Appendix C GS-DOS Commands.....	169
Appendix D Declarations of Conformity	178

Before You Begin

Welcome

Congratulations on the purchase of your new Dolphin 7200 handheld computer. You have made a wise choice in selecting the Dolphin 7200, a device known worldwide for its ergonomic shape, light weight, versatility and single-handed data collection features.

The patented shape allows true, one-handed operation and fits either hand comfortably. Built to last, the Dolphin's ruggedly built case houses a 386 microprocessor and DOS operating system that is easily programmable with standard programming tools like Microsoft Visual C/C++, Visual Basic or Hand Held's family of Simplicity Software.



Dolphin is one of the most durable devices available, and is designed to withstand repeated five-foot drops onto a concrete floor. It also resists extreme temperatures, humidity levels and dust conditions.

The Dolphin's basic features include long-lasting Nickel Metal Hydride (NiMH) batteries, a large, easy-to-read 8 line x 20 character backlit display that can display text or graphics, a natural scan and viewing angle, and two keypad options. The multiple configurations available for the Dolphin 7200 make it one of the most versatile terminals in the automatic data collection industry. The terminal may be equipped with a scan engine capable of reading all standard bar code symbologies. Dolphin 7200 is also available with the IMAGETEAM™ 4250 Image Engine, a low power, high-resolution digital image engine for omni-directional and auto-discrimination reading and decoding of linear barcodes, stacked linear (PDF417) and 2D matrix codes. The image engine functions like a digital camera and also provides OCR (Optical Character Recognition) functionality. Dolphin handheld computer also is available with an integrated digital camera for use with image-capture applications or an iButton reader. The Dolphin 7200 RF terminal may be equipped with an 802.11b or WLIF 2.4 GHz radio for real-time data collection applications.

Load up the Dolphin with your custom software application and the ultimate data collection solution for your business fits in the palm of your hand.

Safety

The Dolphin 7200 handheld computer/bar code scanner meets or exceeds the requirements of all applicable standards organizations for safe operation. However, as with any electrical equipment, the best way to ensure safe operation is to know the possible risks.

The following safety guidelines are designed to protect both you and others around you. Please read them carefully before using your Dolphin.

Required Safety Labels

Dolphin 7200 handheld computer uses a low power Visible Laser to scan bar codes. Short-term exposure to CDRH Class II laser light is not known to be harmful. As with any bright light source, such as the sun, you should avoid direct eye exposure. The following are required safety labels, as they should appear on the back panel of the Dolphin:

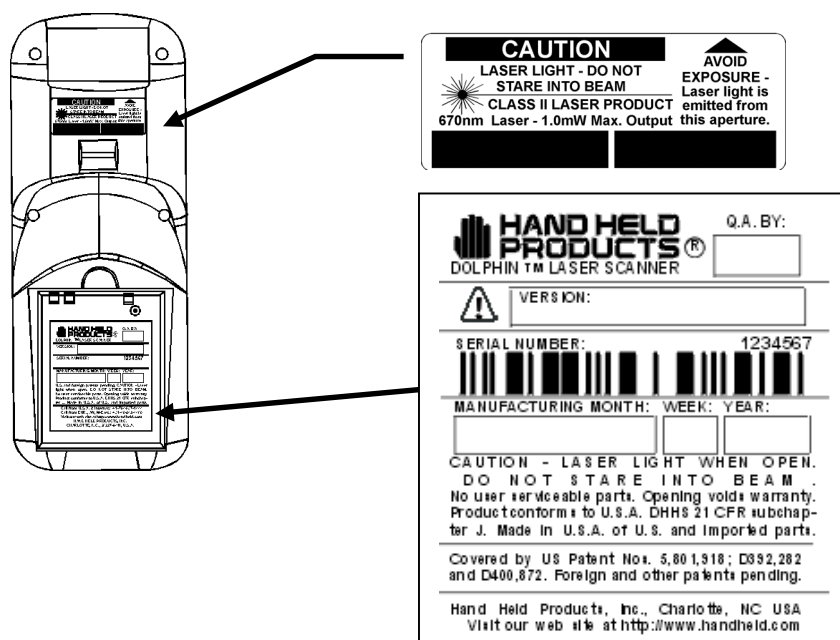


Figure 1 Required Safety Labels for Dolphin 7200 laser-equipped batch terminals

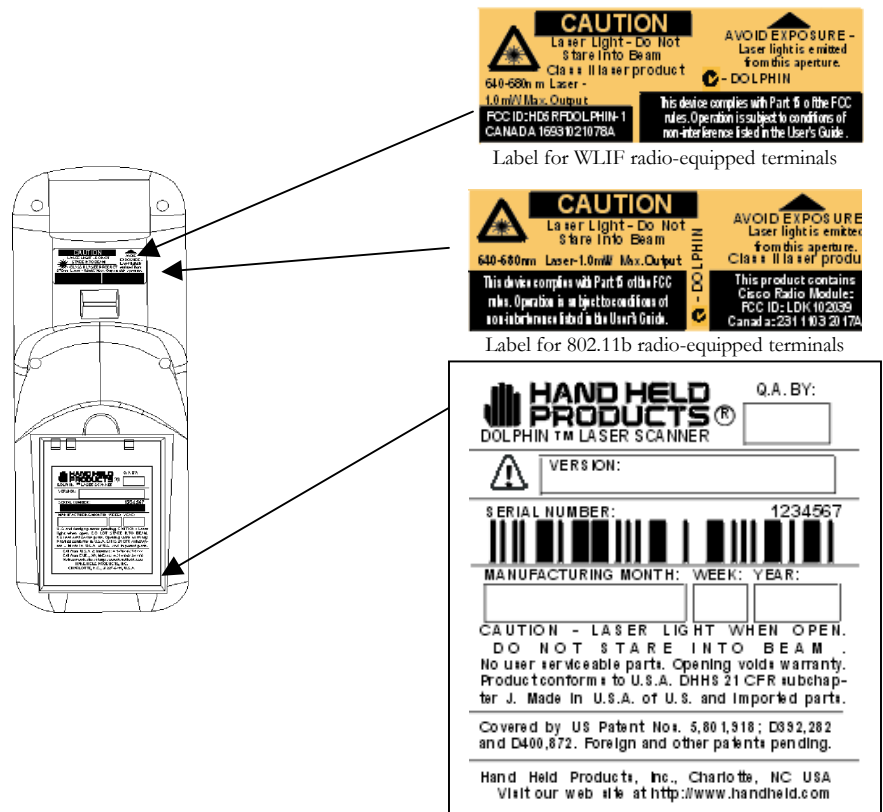


Figure 2 Safety Labels for Dolphin 7200 RF terminals

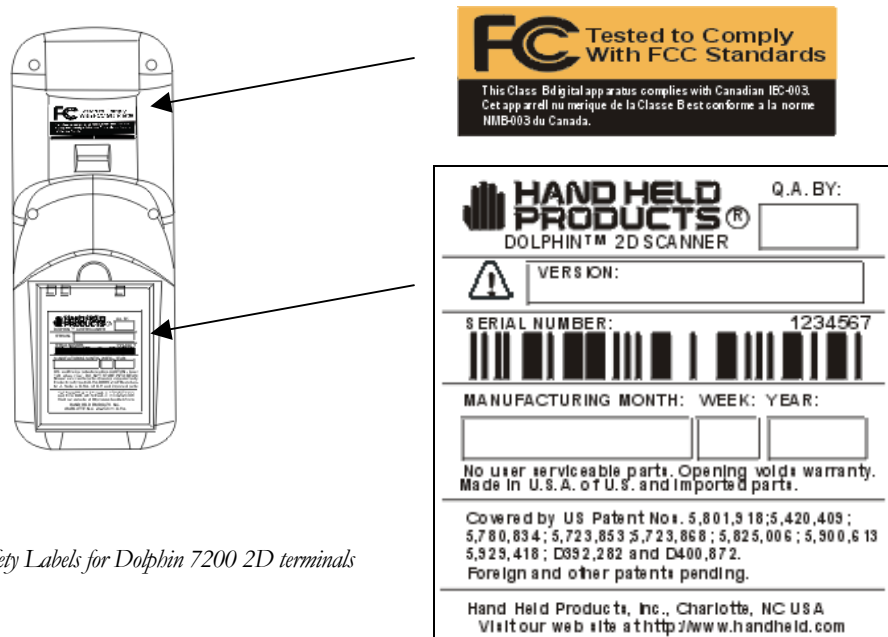


Figure 3 Safety Labels for Dolphin 7200 2D terminals

RF Energy

The Dolphin 7200 RF™ terminal is designed to comply with the most current applicable standards on safe levels of RF energy developed by the Institute of Electrical and Electronics Engineers (IEEE) and the American National Standards Institute (ANSI) and has been recommended for adoption by the Federal Communications Commission (FCC). In addition, the Dolphin RF complies with the specifications for an intentional radiator in Subpart C of Part 15 of the FCC's code of federal regulations. The Dolphin RF also complies with the European specifications ETS 300328 (Type Test of Radio LAN to European standards) and ETS 300826 (EMC Testing of radio equipment).

Statement of Agency Compliance

The Dolphin Batch and Dolphin RF terminals both comply with part 15 of the FCC Rules. Operation is subject to the following two conditions:

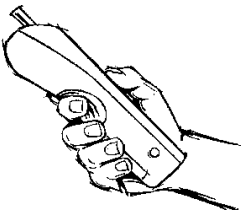
1. Devices may not cause harmful interference.
2. Devices must accept any interference received, including interference that may cause undesired operation.

FCC Class B Compliance Statement

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

Caution: Any changes or modifications made to this device that are not expressly approved by Hand Held Products may void the user's authority to operate the equipment.





Canadian Notice

This equipment does not exceed the Class B limits for radio noise emissions as described in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la classe B prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

CDRH Laser Safety Statement

This product complies with US DHHS 21 CFR J Part 1040.10. This product is a CLASS II LASER PRODUCT with a maximum output of 1.0 mW at 670 nanometers and continuous wave.

EN 60825-1 Laser Safety Statement

This product is classified as a CLASS 2 LASER PRODUCT with a maximum output of 9.0 mW at 670 nanometers per EN 60825-1:1994, Issue 2, June 1997.

R&TTE Directive

The Dolphin 7200 RF is in conformity with all essential requirements of the R&TTE Directive (1999/5/EC). This equipment has been assessed to the following standards: ETS 300 328 ETS 300 826 (November, 1997); EN 60950: 1992, Incl Amdt 1-4, 11.

This product is marked with **CE 168** signifying conformity with Class II product requirements specified in the R&TTE Directive.

The equipment is intended for use throughout the European Community, but its authorization for use in France is restricted as follows: PAN European Frequency Range: 2.402 - 2.480 GHz; Restricted Frequency Range for use in France: 2.448 - 2.480 GHz.

Regulatory and Safety Agency Approvals

Parameter	Specification
U.S.A. Canada Europe Others	FCC Part 15, Class A IEC 0003 EN 55022 (CISPR22) Class A ETS 300 826 Type Certified EMC 89/336/EEC EN 50082-1:1997, EN55024
RF Approvals U.S.A. Canada Europe	FCC Part 15.247 Certified RSS 210 Certified ETS 300 328 Certified

The CE mark on the product indicates that the system has been tested to and conforms with the provisions noted within the 89/336/EEC Electromagnetic Compatibility Directive and the 73/23/EEC Low Voltage Directive.

For further information please contact,
Hand Held Products (UK) Ltd.
1st Floor
Dallam Court Dallam Lane
Warrington, Cheshire WA2 7LT
England

Hand Held Products shall not be liable for use of our product with equipment (i.e., power supplies, personal computers, etc.) that is not CE marked and does not comply with the Low Voltage Directive.

Interference

Pacemakers, Hearing Aids and Other Electrically Powered Devices

Most manufacturers of medical devices adhere to the IEC 601-1-2 standard. This standard requires devices to operate properly in an EM Field with a strength of 3V/m over a frequency range of 26 to 1000MHz.

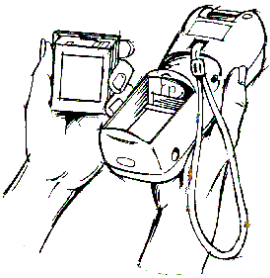
The maximum allowable field strength emitted by the Dolphin is 0.3V/m according to Subpart B of Part 1 of the FCC rules. Therefore, the Dolphin RF will have no effect on medical devices that meet the IEC specification.

Microwaves

The radio in the Dolphin RF terminal operates on the same frequency band as a microwave oven. Therefore, if you use a microwave within range of the Dolphin RF terminal you may notice performance degradation in your wireless network. However, both your microwave and your wireless network will continue to function.

The Dolphin Batch terminal does not contain a radio, and therefore, is not affected by microwave ovens.

Batteries



- Use only the battery supplied with your Dolphin or a replacement battery supplied, recommended, or approved by Hand Held Products, Inc.
- Replace a defective battery immediately as it could damage the Dolphin terminal.
- Never throw a used battery in the trash. It contains heavy metals and should be recycled according to local guidelines.
- Don't short-circuit a battery or throw it into a fire. It can explode and cause severe personal injury.
- Excessive discharge damages a battery. Recharge the battery when your Dolphin indicates low battery power.
- Although your battery can be recharged many times, it will eventually be depleted. Replace it after the recommended usage period (about 500 charge cycles for the 1500 mAh NiMH battery) or if the battery does not hold a charge.
- If you are not sure the battery or charger is working properly, please send it to Hand Hand Products or an authorized Hand Held Products service center, for inspection.

The Dolphin handheld computer/bar code scanner meets or exceeds all applicable standards and has been manufactured to the highest level of quality.

Care and Cleaning of the Dolphin

When needed, clean the laser engine window and the LCD display with a clean non-abrasive, lint-free cloth.

Chapter 1 Getting Started

Summarizes the Dolphin's features, functions and accessories and getting it started for the first time.



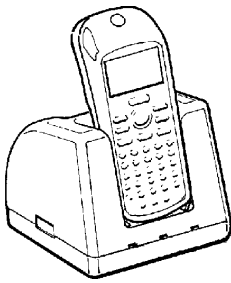
About the Dolphin 7200 Handheld Computer

The Dolphin is a handheld computer and imager/bar code scanner designed for easy, single-handed data collection. It has a 386 33 MHz microprocessor that runs with GS-DOS and is PC-compatible.

Accessories for the Dolphin

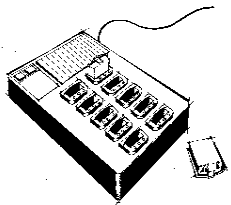
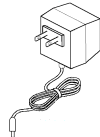
The Dolphin 7200 is part of a data collection system that includes accessories specifically designed for vehicle, desktop and hub operations. Accessories available include serial and networkable communications/charging cradles, desktop “gang chargers” and vehicle mounted charging/communication cradles.

You can use these accessories with the Dolphin:



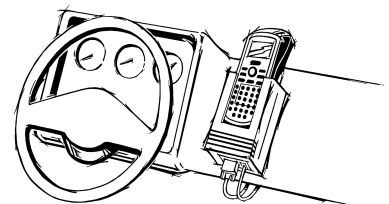
Dolphin HomeBase Dolphin terminal charging, one-slot auxiliary battery charging and communication station, includes power adapter.

Dolphin HomeBase power adapter Replacement power adapter for Dolphin HomeBase. Note: Use only power adapters approved for use by Hand Held Products. Failure to do so may result in improper operation or damage to the unit.

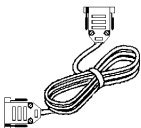


10 Slot Battery Charger for Dolphin Charges and reconditions 10 batteries in under four hours. Supports 90-264V.

VehicleBase Vehicle Kit for Dolphin Battery charging and communications cradle providing connectivity to any serial device including printers, radio modems, GPS, on-board computers and vehicle monitoring systems.

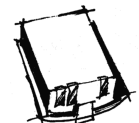


Wrist Strap for Dolphin A convenient way to carry the Dolphin. (Note: Lanyard ring for attaching strap not available with Dolphin RF.)



Holster Another convenient way to carry the Dolphin. Available in leather or cordura, a rugged synthetic fabric.

NiMH Battery Pack Nickel Metal Hydride (NiMH) 3.6V rechargeable battery for the Dolphin.



6' RS-232 Serial Cable Connects HomeBase to your desktop PC.

NOTE

Use your Dolphin only with accessories supplied, recommended or approved by Hand Held Products, Inc. Use of non-approved accessories can be dangerous and will invalidate any warranty or liability claims.



Contact your Value-Added Reseller for more information. For details about how to install or use any of these accessories, refer to the documentation provided with the product.

Dolphin 7200 Models and Options

Hand Held Product's family of Dolphin 7200 handheld portable data collection terminals includes these models:

The **Dolphin™ 7200 Batch** terminal is a DOS programmable handheld computer/bar code scanner with a unique, ergonomic shape designed for single-handed use. The basic terminal has 2MB RAM and 2MB FLASH EEPROM memory. It also features an IrDA infrared transceiver for data communications.

The **Dolphin® 7200 with iButton Reader** handheld computer integrates the basic functionality of the Dolphin Batch terminal with iButton™ technology that allows the terminal to read and write data from and to iButtons. The iButton reader is a function and feature extension of the Batch terminal.

The **Dolphin 7200 RF®** terminal integrates the basic functionality of the Batch terminal with a 2.4GHz RF interface that allows the terminal to communicate with a host computer via a wireless local area network (WLAN). There are two options for this terminal: an 802.11b direct sequence spread spectrum radio or a WLIF frequency hopping spread spectrum radio.



The **Dolphin® 7200 with Image-Capture** terminal incorporates a low-power, high-resolution camera to electronically capture and store images such as signatures, airbills, and damaged cartons. The terminal can also be used to also scan barcodes when equipped with an optional laser scanner.

The **Dolphin® 7200 2D** terminal features the IMAGETEAM™ 4250 Image Engine, a low power, high-resolution digital image engine for omni-directional and auto-discrimination reading and decoding of linear barcodes, stacked linear (PDF417) and 2D matrix codes. The image engine functions like a digital camera and provides OCR (Optical Character Recognition) functionality.

These following options are available for the Dolphin 7200 terminal:

Dolphin Batch	Dolphin RF
36-key alphanumeric keypad <u>or</u> 20-key numeric keypad with shifted alpha characters	36-key alphanumeric keypad <u>or</u> 20-key numeric keypad with shifted alpha characters
Standard, High-Visibility, Long-Range or High Density scan engines	Standard, High-Visibility, Long-Range or High Density scan engines
2 MB RAM with 2 MB non-volatile FLASH memory (expandable to 4, 6, or 10 MB)	2 MB RAM with 2 MB non-volatile FLASH memory <u>or</u> 2 MB RAM with 8 MB non-volatile FLASH memory
No scan engine (manual entry only)	No scan engine (manual entry only)
iButton reader	Terminal emulation software and keypad overlays for IBM 3270, IBM 5250 and DEC VT220 emulation.
Integrated digital CMOS camera	802.11b direct sequence spread spectrum radio <u>or</u> WLIF frequency hopping spread spectrum radio
Integrated image engine	



Bar Code Symbolologies Supported

1D linear codes:

Code 3 of 9, Interleaved 2 of 5, Code 11, IATA 2 of 5, MSI, UPC A, UPC EO, UPC EI, EAN/EAN13, Codabar, Code 128, Code 93, UPC

2D codes:

PDF417, microPDF, Maxicode, Datamatrix, Aztec, QR Code, Code 49

Composite codes:

RSS-14, CODABLOCK, AZTEC MESA

OCR codes (Optical Character Recognition):

OCR A and OCR B

Postal Codes:

Postnet and most international 4 state codes, PLANET CODE, BPO 4 STATE, CANADIAN 4 STATE, DUTCH POSTAL, AUSTRALIAN 4 STATE, JAPANESE POSTAL

Using Dolphin for the First Time

This section will show you how to:

1. Be sure that you've received all items included with your Dolphin order
2. Charge the battery
3. Turn the Dolphin on and off
4. Set the date and time

1 Checking Your Package

Inspect the package to see that the following standard items and accessories (if ordered) are included:

- Dolphin 7200 handheld computer/bar code scanner
- Battery (1500 mAh, Nickel Metal Hydride (NiMH))
- Dolphin 7200 Handheld Computer/HomeBase User's Guide
- Dolphin 7200 HomeBase
- AC-DC Power Adapter for Dolphin HomeBase
- Dolphin Operating System and Development System Software

NOTE

Be sure to keep the original carton and packaging in the event that the Dolphin terminal or Dolphin HomeBase™ should need to be returned for service.

NOTE

*For maximum battery life, Hand Held Products recommends that you deep-cycle (service) the battery **twice** before initial use and then, once a month thereafter.*

2 Charging the Battery

CAUTION: Use only 3.6V battery packs provided by Hand Held Products. The use of any other battery pack in the Dolphin terminal will void your warranty and may result in damage to the Dolphin terminal or battery.

The terminal's NiMH battery is shipped discharged of all power so you must charge it before using for the first time. For maximum battery life, Hand Held Products recommends that you deep cycle the battery **twice** before initial use. To deep cycle, insert the battery into the HomeBase auxiliary battery well. Then, push and hold the **Service Aux Batt** button for at least four seconds.

After deep cycling the battery, you may charge the battery using one of these methods:

- Place the battery in the auxiliary battery well on the Dolphin HomeBase™. Time to Charge: 3 hours
- Place the battery in the 10-slot Dolphin multiple battery charger. Time to Charge: 3 hours
- Install the battery in the Dolphin, place the Dolphin in the HomeBase and connect the HomeBase to an external power source. Time to Charge: 5 ½ hours

For help, see the chapter on the Dolphin. To learn more about managing the terminal's battery power, see *"Maintaining the Dolphin's Batteries"* in Chapter 2.

Inserting the Battery Pack

1. Hold the Dolphin with the front panel (keypad) facing down.
2. Insert the end without the locking tab into the bottom of the battery opening and snap the battery into place with a hinging motion. The battery case serves as the back cover of the Dolphin.

Removing the Battery Pack

1. Hold the Dolphin with the front panel (keypad) facing down.
2. Push the locking tab on the battery pack down and pull the battery out from the Dolphin terminal with a hinging motion.

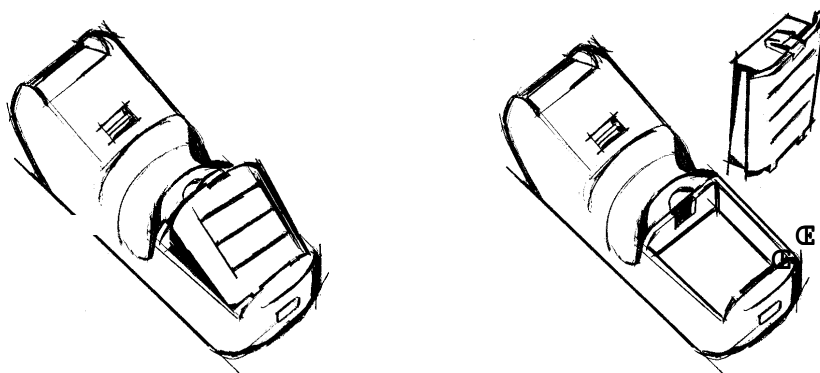


Figure 2 Inserting and Removing the Battery

3 Turning the Dolphin On And Off

Turning On the Dolphin

1. Install the charged battery pack in the Dolphin.
2. Hold the Dolphin in the palm of your hand so that you can press the ON/SCAN key easily with your thumb.
3. Press the ON/SCAN key to turn the Dolphin on. Your Dolphin will boot up just like a desktop PC and the title screen for the HHP Demo Application will appear on the display.

If the title screen does not appear on the display of your Dolphin, the HHP Demo Application has been removed from your terminal. Therefore, you will see a DOS prompt on the screen. Example: C:\ or A:\.

Note: If using the Dolphin for first time or if the terminal has been without a battery pack for more than 30 minutes and you are now inserting a battery, you may receive a CMOS error when the terminal boots up. Don't worry, the terminal is OK. This simply means that the internal back-up battery needs to be recharged and the date and time need to be reset. To recharge the internal backup battery and reset the date and time, insert a fully charged battery in the Dolphin and then use the DOS date and time function to set the correct date and time. The internal back-up battery requires a minimum of 5 hours of charging time in order to perform and maintain the system as described on page 30.

Turning the Dolphin Off

The Dolphin is never actually turned off. To conserve power, the Dolphin goes into “sleep mode” when it is inactive for a programmed period of time as defined by your application. The screen is blank when the Dolphin is in “sleep mode.”

4 Setting the Date and Time

Use the DOS date and time function to set the correct date and time for your Dolphin terminal.

To set the date on an alphanumeric Dolphin:

1. Enter <DATE> at the Dolphin's DOS prompt.
2. Press NUM LOCK to put the Dolphin in numeric mode.
3. Enter the new date <mm-dd-yy>.
4. Press <ENTER>.

To set the date on a numeric Dolphin:

- 1.** Press <SHIFT> to put the Dolphin in alpha mode.
- 2.** Enter <DATE> at the Dolphin's DOS prompt. See the section called *Using the Numeric Keypad* in Chapter 2 for more information.
- 3.** Press <SHIFT> to put the Dolphin back in numeric mode.
- 4.** Enter the new date <mm-dd-yy>.
- 5.** Press <ENTER>.

To enter the new time, enter <'TIME> at the Dolphin's DOS prompt instead of <DATE> and follow the directions for the Dolphin model you are using.

Chapter 2 Dolphin Basics

Describes system features and explains how to use the Dolphin's keypad, display, batteries, drives and scanner.

System Features

CPU

The Dolphin's computing power is provided by a highly integrated AMD ELAN SC310 386SX 33 MHz microprocessor.

Disk Drives

The Dolphin contains two disk drives that provide storage for system files, applications, and data. A third drive is also present if you purchase the FLASH expansion option.

NOTE

Drive B is an image of the A drive and not a physical drive.

Drive A

Drive A contains 256K executable FLASH EEPROM to store system utilities and to initialize the boot process. This drive is read-only and is not usable by the developer/end-user.

Drive C

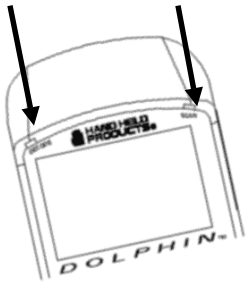
Drive C is a 2MB or 8MB FLASH virtual hard drive used for program and data storage.

Drive D

If you add the expanded memory module to your Dolphin Batch terminal, it will appear as Drive D. Up to 8MB of additional FLASH memory can be added via the FLASH expansion module. *Note: This option is not available for the Dolphin RF.*

Front Panel Physical Features

This section describes features on the Dolphin's front panel. The alphanumeric and numeric Dolphins have identical back panels.



Light Emitting Diodes (LED)

The red LED located at the upper right corner of the LCD display is labeled 'SCAN'. This LED illuminates when the user presses the ON/KEY key and activates the scan engine.

The green LED located at the upper left corner of the LCD display is labeled 'DECODE.' This LED illuminates when the bar code software successfully decodes a bar code. Both LEDs are software programmable.

Liquid Crystal Display (LCD)

The alphanumeric, scrollable LCD consists of nine rows with 20 character positions per row and 119 x 73 graphics pixels, which are software addressable. The electroluminescent backlight allows you to view the display in low light conditions. To conserve power, the backlight is automatically turned off after 30 seconds. The on/off function and contrast is software programmable.

Note: The ninth row is used for system icons and application-defined icons.



Speaker

The Dolphin Batch terminal's internal speaker emits a sound level of 80dB at 10 cm. The sound level for the Dolphin RF terminal's external speaker is 90dB at 10 cm.

RF Antenna

The Dolphin RF terminal's 1.36 inch (34.5 mm) antenna is a unity gain, helically-loaded, monopole antenna.

Using the Alphanumeric Keypad

The Dolphin's alphanumeric, splash-resistant keypad has 36 epoxy coated keys. The keyboard's yellow background enhances the readability of the numeric and special character keys.

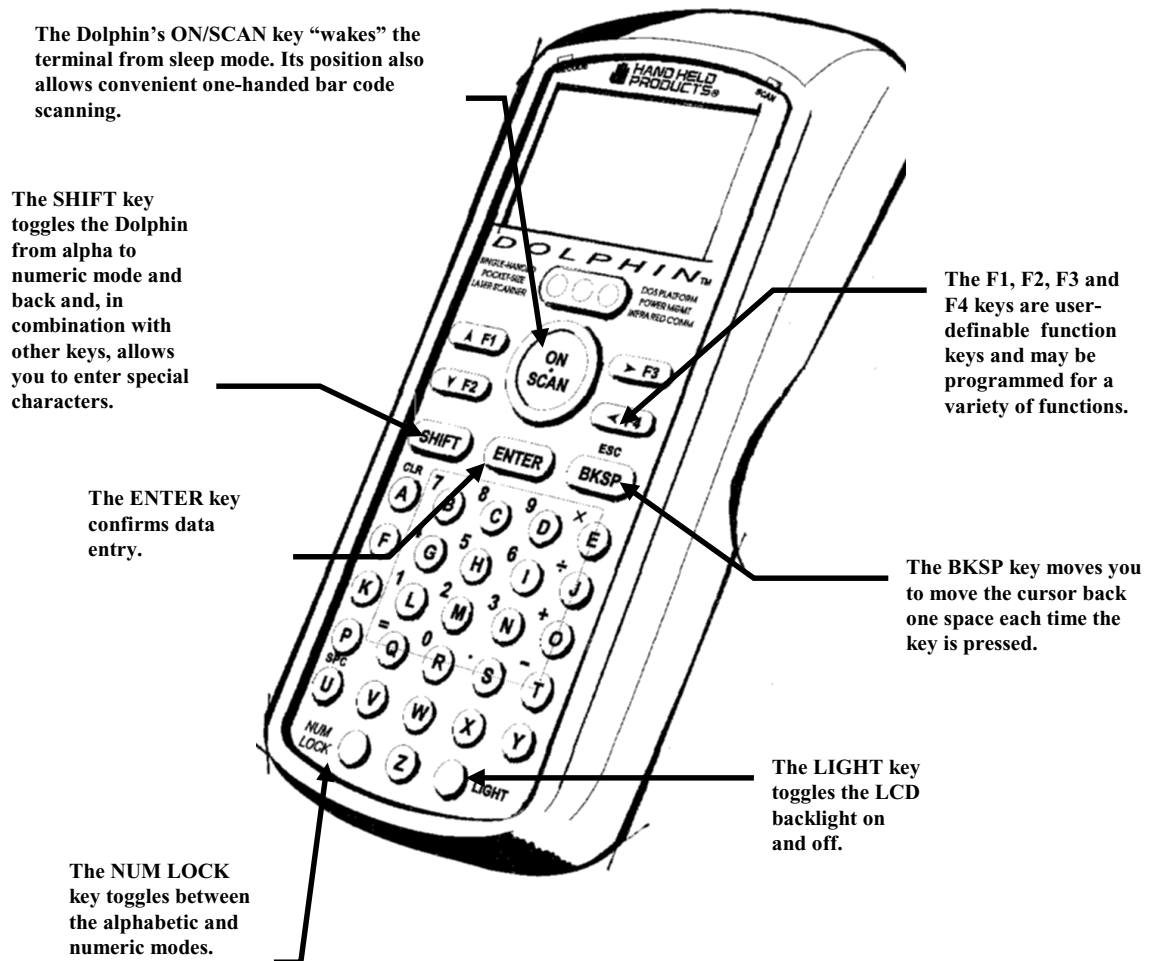


Figure 3 Dolphin Alphanumeric Keypad

Key Combinations For Keypad Functions and Special Characters

Use the key combinations listed below to access certain keypad functions or to use special characters that are not defined on the Dolphin keypad.

Key Combination	Function/Special Character
ESC (SHIFT + BKSP)	The ESC function performs a cancel action.
SPC (SHIFT + U)	The SPC function moves the cursor forward one space at a time.
CLR (SHIFT + A)	The CLR function erases the line of data just entered, if the ENTER key has not yet been pressed.
SHIFT + F	#
SHIFT + K	@
SHIFT + P	&
SHIFT + V	\$
SHIFT + W	%
SHIFT + X	!
SHIFT + Y	\
SHIFT + Z	:
SHIFT + E	*
SHIFT + J	/
SHIFT + LIGHT	Changes Contrast

Figure 4 Key Combinations for Alphanumeric Keypad

Using the Numeric Keypad

The Dolphin's numeric, splash-resistant keypad has 20 epoxy coated keys. The large, amber-color keys are large, easy-to-read, and comfortably spaced to help prevent errors in data entry. Digits can be entered without using the shift key.

Though designed primarily for numeric data entry, you can use the SHIFT key to switch between numeric and alpha modes or to use special characters.

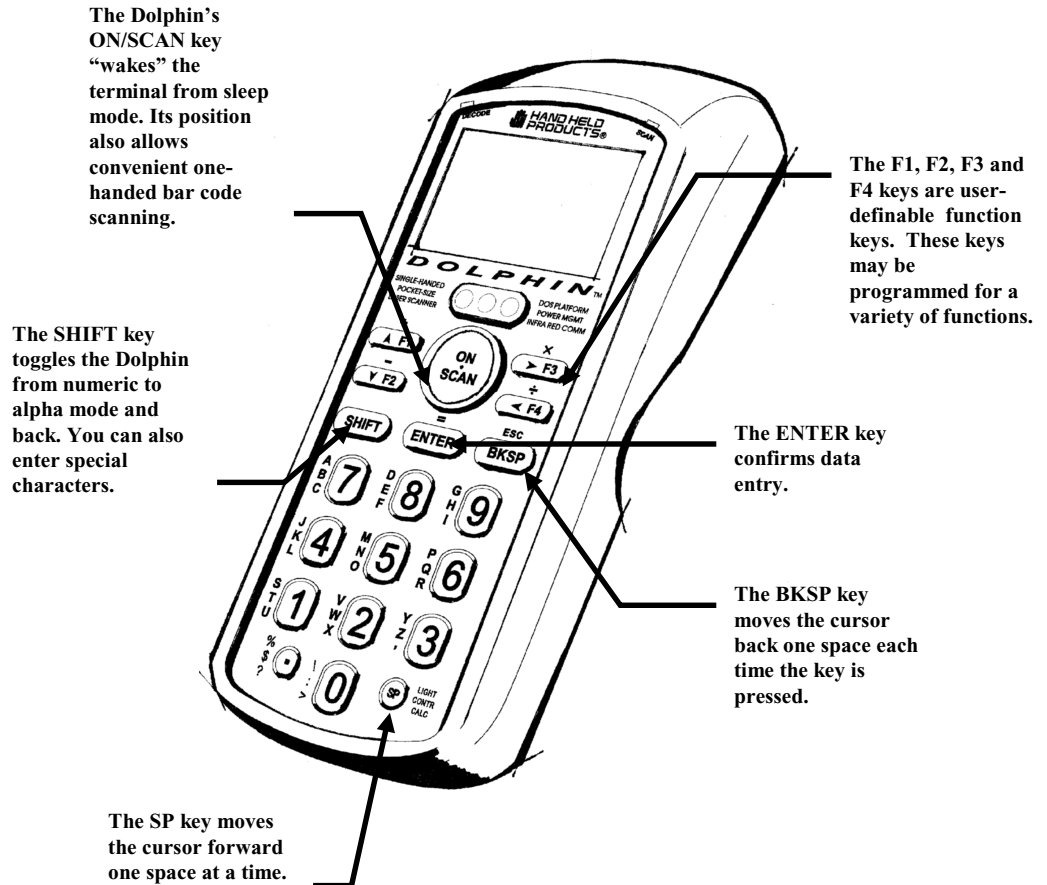


Figure 5 Dolphin Numeric Keypad

Key Combinations For Keypad Functions and Special Characters

Key Combination	Function
ESC (SHIFT + BKSP)	The ESC function performs a cancel action.
LIGHT (SHIFT + SP)	This action toggles the LCD backlight on and off. Press the SHIFT key to put the Dolphin in alpha mode and press the SP key once.
CONTR (SHIFT + SP+SP)	The CONTR function adjusts the LCD contrast. Press the SHIFT key to put the Dolphin in alpha mode and press the SP key twice. Use the F1 and F2 keys to adjust the contrast up or down. When finished, press the BKSP key.
CALC	This function is undefined. However, it can be programmed by a custom application to load a calculator utility.

Figure 6 Key Combinations and What They Do
Numeric Keypad

Entering Alpha and Special Characters

1. Press the **SHIFT** key to switch the numeric keypad to alpha mode. This is indicated by the **<ABC>** symbol indicated on the LCD. Each numeric key, as well as the “.” Key has three letters or symbols listed beside it.
2. To display the first letter or symbol next to a key, press the numeric key once.
3. To display the second letter/symbol, press the key next to the desired letter/symbol **twice** within one second.

4. To display the third letter/symbol, press the key next to the desired letter/symbol **three** times within one second.

For example, to enter a letter “G” into the Dolphin terminal, press the **SHIFT** key to put the Dolphin in alpha mode. Press the “9” key **once** and the letter “G” will be entered.

To enter a “T” into the Dolphin terminal, press the **SHIFT** key to put the Dolphin in alpha mode. Press the “1” key **twice** and the letter “T” will be entered.

Display Symbols

Here is a list of the symbols that can appear on the LCD display of your Dolphin and their meanings.

Battery Charge



Battery charging symbol blinks while main battery in the Dolphin terminal is charging in the Dolphin 7200 HomeBase. Located in lower left-hand corner of the LCD.

NOTE

The battery charge level symbol is only an estimate of the remaining battery life.



Battery charging symbol shown above switches from a blinking arrow to a blinking check when the unit has completed charging in the HomeBase.



Indicates charge level of the Dolphin terminal’s main battery when the terminal is in use. The charge symbol decreases in size as the charge level drops. Located in lower left-hand corner of the LCD.

When this symbol is blinking, the battery’s charge is critically low and you should recharge it as soon as possible.

For information on battery capacity and charging, see the section on Maintaining the Dolphin’s Batteries later in this chapter.

Keyboard Mode

These symbols indicate which mode is operational on the keyboard and are located next to the battery charge indicator. Use the **SHIFT** key to toggle between numeric to alpha mode on Dolphin.



Alpha mode -- alphabetic characters are active



Numeric mode -- numeric characters are active

[illegible]

31

Laser Engine

The Dolphin 7200 is currently available with five scanning options:

- Standard range
- Long range
- High density scanning
- High visibility scanning
- No scan engine

The laser engine converts reflected light into a digital pattern that represents the bar code data. A clear window covers the laser engine to protect it from dust and dirt.

Image Engine

The Dolphin 7200 2D terminal is available with the following imaging options:

- Standard image engine: scans 2 to 9 in. (5 to 23cm)
- High-Density: scans 2 to 4 in. (5 to 12cm)

Lanyard Eyelet for Optional Wrist Strap

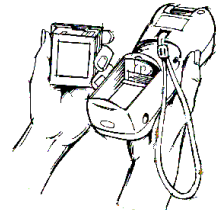
This feature allows a strap to be attached to the Dolphin terminal so that it can be conveniently secured around the wrist or hooked on to a belt. Not available on the Dolphin 7200 RF, Dolphin 7200 with Image-Capture or the Dolphin 7200 2D terminals.

NOTE

Under normal circumstances, you should never need to reset your Dolphin terminal.

Battery Well

The Battery Well is a recessed area on the back of the Dolphin that holds the 3.6V battery pack.



Reset Switch

The Reset Switch is located inside the Dolphin terminal and is accessible through a small opening within the battery well. To reset the Dolphin, remove the label covering the opening and press the reset switch with a small blunt object such as a paper clip.

Infrared Communications Port

The Infrared Communications Port allows the Dolphin to communicate through the Dolphin HomeBase to a host serial device.

Battery Charging Contacts

When the Dolphin is placed in the main well of the Dolphin HomeBase, the Dolphin's battery pack is charged through these contacts.

Maintaining the Dolphin's Batteries

CAUTION: Use only the 3.6V battery packs provided by Hand Held Products. The use of any other battery pack in the Dolphin 7200 terminal will void your warranty and may result in damage to the Dolphin terminal or battery.

There are two batteries in the Dolphin:

Internal NiMH Backup Battery

Located inside the Dolphin, this battery backs up the RAM and clock when the NiMH main battery is discharged or removed from the terminal.

NOTE

Never insert the Dolphin into the HomeBase without the NiMH main battery pack inserted.

NiMH Battery Pack

The battery pack is the primary power source for operating the Dolphin.

Internal NiMH Backup Battery

The Dolphin's internal backup battery prevents the terminal from being reset if you need to remove and replace the main battery pack. The battery retains RAM data and allows the real-time clock to remain operational for up to 30 minutes when the battery pack is removed. If the internal back-up battery becomes discharged of power, it requires a minimum of 5 hours of charging time in order to perform and maintain the system as described above.

The internal backup battery is charged by the Dolphin's main battery pack. If the terminal is left without the main battery pack for more than 30 minutes, the internal backup battery needs to be recharged.

Note: Data and programs on Drives C and D remain safe even if the internal backup battery fails. However, you must reset the real-time clock using the DOS Time and Date function.

NOTE

Return the Dolphin to an authorized service center when the internal battery needs to be replaced.

Follow these guidelines to maximize the life of the Dolphin's backup battery:

- Keep a charged NiMH battery pack in the Dolphin. The internal battery will prematurely discharge if there is not at least a partially charged battery in the terminal.
- Put the Dolphin in the HomeBase when the terminal is not in use.

NiMH Battery Pack



The 3.6V, 1500 mAh Nickel-Metal-Hydride (NiMH) battery pack is the primary power source for the Dolphin. Other Nickel-Metal-Hydride batteries may be approved by Hand Held Products, Inc. to work with your Dolphin. Contact Hand Held for more information.

NOTE

Keep a charged battery pack in the Dolphin at all times to conserve the internal back-up battery.

NOTE

*For maximum battery life, Hand Held Products recommends that you deep-cycle (service) the battery **twice** before initial use and then, once a month thereafter.*

The 1500 mAh NiMH battery is designed to operate in temperature range of -10 to 50 °C (14 to 122° F). For maximum performance, charge the batteries between 10 and 35 °C (50 and 95° F).

Performance specifications for a fully charged 1500 mAh NiMH battery:

Up to 20 hours of usage in a Dolphin Batch terminal with a full battery charge

Up to 10 hours of usage in a Dolphin RF terminal with a full battery charge

Keep a charged battery pack in the Dolphin at all times to conserve the internal back-up battery. When you remove a battery pack, insert another battery pack in the Dolphin. The internal battery will prematurely discharge if there is not at least a partially charged battery in the terminal.

Servicing the Battery Pack

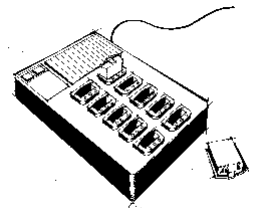
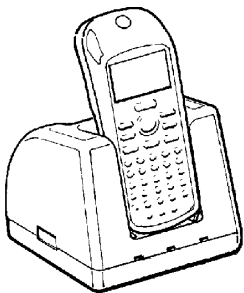
For maximum battery life, Hand Held Products recommends that you deep cycle the battery **twice** before initial use. It is also recommended that you service, or calibrate the battery once per month. To deep cycle, insert the battery into the HomeBase auxiliary battery well. Then, push and hold the **Service Aux Batt** button for at least 4 seconds.

For more information, see the section on the *Service Aux Batt* feature of the HomeBase in Chapter 7.

Charging the Battery Pack

You can recharge an individual battery pack using the auxiliary battery well of the Dolphin HomeBase or the Dolphin 10-Slot Multiple Battery Charger. Both accessories use a charging method that senses when the battery pack is fully charged and then drops to a trickle charge to keep the battery pack at full capacity.

For more details, see the section on *Charging Batteries in the HomeBase* in Chapter 7.



Storing Batteries

To maintain top performance from batteries, follow the guidelines below when storing them:

- Avoid storing batteries outside of the specified range of -4 to 104° F (-20 to 40°C) or in extremely high humidity.
- For prolonged storage, do not keep batteries stored in the terminal.
- During long-term storage, battery deactivation may tend to occur which may cause charging to stop early during recharging after storage. This issue can be handled by charging and discharging the battery several times. Also, the first charging after prolonged storage may yield a lower than normal capacity. While this will vary depending on the storage conditions, charging and discharging the battery several times will almost completely restore capacity.

Chapter 3 Dolphin® 7200 RF Handheld Computer

About the Dolphin 7200 RF Handheld Computer

The **Dolphin 7200 RF®** terminal integrates the basic functionality of the Batch terminal with an 802.11b or a WLIF™ interface that allows the terminal to communicate with a host computer via a wireless local area network (WLAN). Both radio options operate in the 2.4 GHz frequency band. Terminal emulation software and keypad overlays for IBM 3270, IBM 5250 and DEC VT100/220 emulation are available for both radio options. The terminal's DOS compatible 386 microprocessor is easy to program and developers can create wireless applications linked to a host PC, using RF Simplicity® and MS Visual Basic™.

Refer to Chapters 1 and 2 in this manual for more on basic operation of the Dolphin terminal and accessories available.

802.11b-Compliant Dolphin 7200 RF Terminal

The 802.11b-compliant Dolphin 7200 RF incorporates a Cisco® 802.11b Micro-ISA radio. The radio uses direct sequence spread spectrum (DSSS) technology, which spreads its signal continuously over a wide frequency band, and provides an Ethernet-like data rate of up to 11 megabits per second. The radio may also provide up to 128-bit Wired Equivalent Privacy (WEP) encryption. WEP is used to encrypt and decrypt data signals transmitted between Wireless LAN (WLAN) devices. It is an optional security encryption mechanism defined within the 802.11 standard that makes a wireless LAN link as secure as a traditional wired link. The optional WEP security mechanism is available with 128-bit or 40-bit encryption.

Dolphin 7200 RF is interoperable with other 802.11b-compliant products to allow network expansion as needed. It can be connected to other devices, such as printers and PCs via PC-card adapters.

Configuring Your 802.11b- Compliant Dolphin 7200 RF Terminal

The Dolphin 7200 RF Utilities program provides basic functions required to prepare your terminals for use. The program also includes a Scan Demo, Help, and an Inventory Control demo.

When you cold-boot or reset the terminal, the title screen shown below appears. Press the <ENTER> key to continue.



Dolphin 7200 RF Title Screen

Main Menu

The Dolphin 7200 RF Main Menu shown appears after the title screen:



Dolphin 7200 RF Main Menu

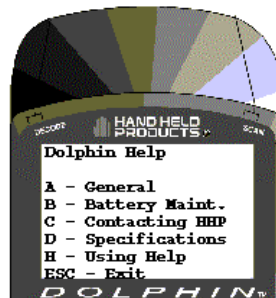
F1-Scan



F1-Scan Menu

This option demonstrates how the Dolphin 7200 RF terminal scans bar codes. Press F1 to configure the terminal to read linear barcodes. Follow the directions on the screen to set-up which bar codes you want the terminal to read. Once the terminal is configured, press <ESC> and then the <ON/SCAN> Button to scan a bar code.

F2-Help



F2-Help Menu

This option is an online help file with general information about using the Dolphin 7200 RF terminal, battery maintenance, contacting Hand Held Products, specifications and navigating through the help file.

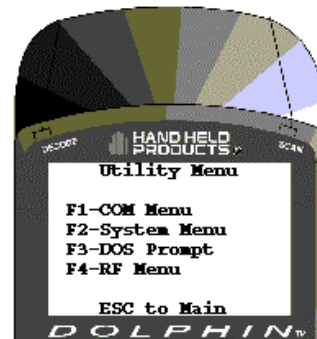
F3-HHP Demo



F3-HHP Demo

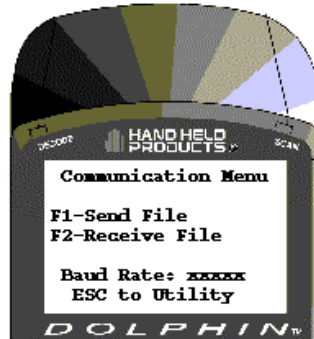
The HHP Demo is a sample inventory control program.

F4-Utilities Menu



F4-Utility Menu

F1-COM Menu



F1-COM Menu

Use this menu to send and receive files when transmitting data via HomeBase or VehicleBase to the local area network. Press <F1> to send a file. Press <F2> to receive a file. For more information on sending or receiving files with the Dolphin 7200 HomeBase, see the section on Setting Up For Communications in Chapter 7. See Chapter 8 for more information on communications with the Dolphin 7200 Compact HomeBase.

F2-System Menu



F2-System Menu

This option allows you to view system information such as version and serial numbers about specific Dolphin 7200 RF terminals. You may also enable or disable the reboot setting and turn the display status line on or off.

F3-DOS Prompt

Press <F3> to exit to the DOS prompt.

F4-RF Menu

Press <F4> and the menu below will appear. Use options from this menu to configure the Dolphin 7200 RF for use in your wireless local area network.



F4-RF Menu

F1 RF Setup

To configure the terminal for use in a local area network, press <F1> and enter the data for each of the options on the screen shown below:



RF Setup Menu

You cannot change the MAC address on the Dolphin terminal. Each terminal has its own unique factory-set MAC address. The MAC address is a standardized data link layer address that is required for every port or device that connects to a LAN. Other devices in the network use this address to locate specific ports in the network and to create and update routing tables and data structures.

F1 SET SSID

Press <F1> to set the SSID. This value is case sensitive. Enter a value for the SSID option and press <ENTER>. Once the SSID is written, the Dolphin 7200 RF terminal must be reset to activate the new SSID.

The SSID (Service Set Identifier) is a unique, case-sensitive identifier that is attached to selected packets sent out over the radio network. Nodes associating to the access point must use the same SSID or their association requests will be ignored. The SSID can have up to 32 characters.

NOTE

The **SSID** and **Subnet Mask** on the Dolphin terminal must match the settings on the access point.

NOTE

Reset the Dolphin terminal by pressing and releasing the **<SHIFT>**, **<ON/SCAN>** and **<BKSP>** keys. All three keys must be held down and released at the same time.

NOTE

The Dolphin need not be reset after each configuration change, but can be done once all configurations changes have been made.

F2 SET NODE

Press **F2** to set a system name for the Dolphin 7200 RF terminal. Enter a value for the NODE option and press **<ENTER>**. Once the NODE is written, the Dolphin 7200 RF terminal must be reset to activate the new NODE. The name should describe the location or principal users of the Access Point.

F3 R/W IP ADDRESS

Press **F3** to enter the IP address. Enter a value for the IP Address option and press **<ENTER>**. Once the IP Address is written, the Dolphin 7200 RF terminal must be reset to activate the new IP Address.

The IP address is a 32-bit address assigned to hosts using TCP/IP. An IP address belongs to one of five classes (A, B, C, D, or E) and is written as four octets separated by periods (dotted decimal format). Each address consists of a network number, an optional sub network number, and a host number.

F4 R/W SUBNET MASK

Press **F4** to enter the Subnet Mask. Enter a value for the Subnet Mask option and press **<ENTER>**. Once the Subnet Mask Address is written, the Dolphin 7200 RF terminal must be reset to activate the new Subnet Mask.

The Subnet Mask is the portion of an IP address that is specified as the sub network by the subnet mask.

Setting WEP Modes And Keys On The 802.11b Radio Card

This section describes how to set WEP (Wired Equivalent Privacy) modes and keys on the Cisco® 802.11b radio card.

WEP is used to encrypt and decrypt data signals transmitted between Wireless LAN (WLAN) devices. WEP is an optional IEEE 802.11 feature used to provide data confidentiality that is equivalent to the confidentiality of a wired LAN that does not employ crypto techniques to enhance privacy. WEP makes a wireless LAN link as secure as a wired link.

The **wep.bat** utility is used to set WEP modes and keys for the Cisco® 802.11b radio card. The **wep.bat** file uses three files:

wepdos.exe – an executable file that configures WEP values for the Cisco radio

keys.exe – an executable file that calls the functions for setting WEP values

cscpkt.ini – a configuration file for the Cisco radio

All four files are located in the Dolphin **c:\rf directory** that is part of the **stackcsc.exe** file.

If the user will be setting WEP keys using the batch mode, the user must create a **keys.txt** file using a text editor such as Notepad and then copy it to the **c:\rf** directory. This file will contain the encryption keys used when operating in WEP mode. For obvious security reasons, this file will be automatically deleted upon running the **wep.bat** utility. HHP recommends that you verify that the **keys.txt** file has been deleted.

Refer to the Cisco documentation for complete descriptions of the various WEP modes. The current radio card may not support some modes.

Running the WEP.BAT Utility

This section describes usage and command line options for the WEP.BAT utility.

NOTE

Reset the Dolphin terminal by pressing and releasing the <SHIFT>, <ON/SCAN> and <BKSP> keys. All three keys must be held down and released at the same time.

Note: The WEP.BAT file must be run with the radio driver **NOT** loaded. Reboot the Dolphin 7200 RF terminal with the ON/SCAN key depressed so that the driver will not load.

WEP [BATCH] [HEX] [ASCII] [STATUS] [SELECTKEY#] [CLEARKEY#]
[OPEN] [WEPshared] [WEPOpen]

WEP OPTIONS

BATCH	Sets radio WEP keys using the file keys.txt .
HEX	Sets radio WEP keys using a hex string entered via the keyboard.
ASCII	Sets radio WEP keys using ASCII characters entered via the keyboard.
STATUS	Displays encryption level and key lengths.
SELECTKEY #	Selects operating key used during operation with access point.
CLEARKEY #	Clears operating key.
OPEN	Disables WEP operation even if keys have been set (no encryption) .
WEPshared	Sets WEP mode to WEPshared. In this mode, the Access Point sends a plain-text, shared-key query to any device attempting to communicate with the Access Point.
WEPOpen (default)	Sets WEP mode to WEPOpen which allows any device, regardless of its WEP settings, to authenticate and then attempt to communicate with the Access Point.

Example 1: To configure WEP using the batch mode, create the **keys.txt** file using a text editor as shown:

Sample ASCII **keys.txt** file for 40-bit encryption where **x** is the key code:

```
ASCII
xxxxx
xxxxx
xxxxx
xxxxx
xxxxx
xxxxx
```

Sample HEX **keys.txt** file for 128-bit encryption where **x** is the key code:

```
HEX
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
```

After creating the **keys.txt** file, copy it to the **c:\rf** directory and enter:

```
C:>\WEP BATCH
```

Result: The WEPOPEN operating mode is automatically set (the WEP mode can be changed using commands shown later in this document). One of the following messages will display on the terminal:

Need keys.exe and keys.txt (if both files are not present)

or

Error(s) : Retry (if error occurred writing to radio card)

or

Done (if keys successfully set)

Example 2: To set the WEP keys using an ASCII character string via the Dolphin terminal keyboard, enter

```
C:\> WEP ASCII 11111 X 33333 X
```

There are four WEP keys to set. To skip a key code, enter <x> for each blank entry. In the example above, only keys 1 and 3 have a value; 2 and 4 have no value. An ASCII character string of 5 characters sets 40-bit encryption and 13 characters sets 128-bit encryption on the terminal.

Result: This will set key1 to 11111 and key3 to 33333. Keys 2 and 4 are not set. 40 bit WEP will be used. The terminal will display one of the following screens:

Error(s) : Retry (if an error occurred writing to radio card)

or

Done (if keys successfully set)

Example 3: To configure WEP using a HEX string via the Dolphin terminal keyboard, enter:

```
C:\> WEP HEX 1111111111111111111111111111 X X X
```

There are four WEP keys to set. To skip a key code, enter <x> for each blank entry. In the example above, only key 1 has a value; 2, 3 and 4 have no value. A HEX string of 10 characters sets 40-bit encryption and 26 characters sets 128-bit encryption.

Result: Sets key1 to 1111111111111111111111111111. Keys 2, 3 and 4 are not set. 128 bit WEP will be used. The terminal will display one of the following screens:

Error(s) : Retry (if error occurred writing to radio card)

or

Done (if keys successfully set)

Example 4: To display the radio's WEP settings, enter

```
C:\>WEP STATUS
```

Result: The terminal will displays the settings as shown below:

```
WEP128 encryption
Key 1 Len:13
Key 2 Len:13
Key 3 Len:13
Key 4 Len:13
key index is 1
      (i.e. the active key)
```

Note: The first line indicates the capability of the radio; not the encryption level.

Example 5: To select the key to be used during operation with the access point, enter

```
C:\>WEP SELECTKEY 2
```

Result: The terminal will display the following:

```
Setting transmit key index to 2.
Key2 Selected.
```

Example 6: To clear the active key, enter

```
C:\>WEP CLEARKEY 2
```

Result: The terminal will display the following:

```
Clearing DefaultKey 2.
Key2 Cleared.
```

Example 7: To enable the WEP WEP SHARED mode, enter

```
C:\>WEP WEP SHARED
```

Result: Sets the AuthType parameter in the cscpkt.ini file to "WEP SHARED". The terminal will displays the following:

```
WEP mode WEP SHARED
```

WLIF™-Compliant Dolphin 7200 RF Terminal

The WLIF-compliant Dolphin 7200 RF™ terminal incorporates a high performance radio that uses frequency hopping spread spectrum technology compliant to the Proxim® WLI Forum/OpenAir™ specification. The radio operates at a data rate of up to 1.6 megabits per second, with 15 independent channels available.

Frequency hopping technology is inherently secure in that the signal hops among a variety of frequencies and, at any instant in time, the signal is broadcast on only one frequency. The transmission remains on each frequency for only a short period (up to 0.4 second) before moving to the next frequency.

Dolphin 7200 RF is interoperable with all WLIF-compliant products to allow network expansion as needed. It can be connected to other devices, such as printers and PCs via PC-card adapters.

Configuring Your WLIF-Compliant Dolphin 7200 RF Terminal

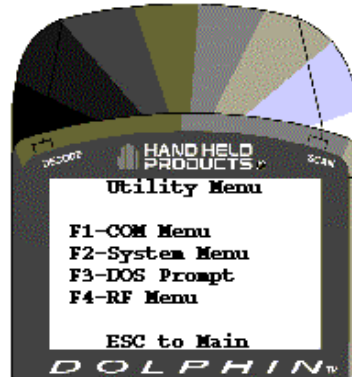
The Dolphin 7200 RF Utilities program provides basic functions required to prepare your terminals for use. The **F1** Scan Demo, **F2** Help, and **F3** HHP Demo programs on the main menu shown below function the same as they do for the 802.11b-compliant Dolphin 7200 RF unit. For more information, refer to the section on the main menu for the 802.11b terminal.



Dolphin 7200 RF Main Menu

F4 Utilities Menu

Press <F4>, the following screen will appear:



F4-Utility Menu

The **F1**, **F2** and **F3** functions on the Utility menu for WLIF-compliant terminals are the same as the 802.11b-compliant terminals. For more information, refer to the section on the **Utility Menu** in the configuring 802.11b terminals section.

F4 RF Menu

Press <F4> and the menu shown below will appear:



F4-RF Menu

F1 RF Setup

To configure the terminal for use in a local area network, press <F1> and enter the data for each of the options on the screen shown below.



F1-RF Setup

NOTE

Reset the Dolphin terminal by pressing and releasing the <SHIFT>, <ON/SCAN> and <BKSP> keys. All three keys must be held down and released at the same time.

F1 SET SECURITY ID

Press <F1> to set the Security ID. Enter a value for the Security ID option and press <ENTER>.

The Security ID is a unique, 20 character alphanumeric string defined and configured by the user. It must be identically configured in every radio intended to communicate with others in the same network.

F2 R/W RADIO DOMAIN

Press <F2> to enter the Radio Domain. Once the Radio Domain is written, the Dolphin 7200 RF terminal must be reset to activate the new Radio Domain.

The Domain is the area within a LAN that defines a region administered by an access point. It is a software filter that does not affect the actual radio frequency or the frequency hopping sequence. The Domain is a number between 0 and 15. It is the equivalent of a wireless subnet.

NOTE

The Dolphin need not be reset after each configuration change, but can be done once all configurations changes have been made.

F3 R/W IP ADDRESS

Press <**F3**> to enter the IP address. Once the IP Address is written, the Dolphin 7200 RF terminal must be reset to activate the new IP Address.

The IP address is a 32-bit address assigned to hosts using TCP/IP. An IP address belongs to one of five classes (A, B, C, D, or E) and is written as four octets separated by periods (dotted decimal format). Each address consists of a network number, an optional sub network number, and a host number.

NOTE

The **Security ID**, **Radio Domain** and **Subnet Mask** on the Dolphin terminal must match the settings on the access point.

F4 R/W SUBNET MASK

Press <**F4**> to enter the Subnet Mask. Once the Subnet Mask is written, the Dolphin 7200 RF terminal must be reset to activate the new Subnet Mask.

The Subnet Mask is the portion of an IP address that is specified as the sub network by the subnet mask.

Dolphin 7200 RF Peripherals

Peripherals for building wireless networks using Dolphin 7200 RF terminals include PC cards, access points, and antennas. Peripherals available for 802.11b Direct Sequence radio networks are Wi-Fi™ certified; peripherals for Frequency Hopping radio networks are OpenAir® compliant.

PC Cards

PC cards provide devices such as laptop and desktop computers with wireless connectivity to the RF network.

Access Points

Access Points link a wired network to a wireless Dolphin 7200 RF handheld computer network.

There are a wide range of mounting brackets and antenna cabling options available to provide wireless coverage for a customer's entire facility. Access points can be easily configured and managed from a server or using a web browser or telnet session.

See your Access Point user's guide for more information.

Antennas

Various antenna options are available to extend the range of access points in your 802.11b or WLIF wireless network. Antennas available include:

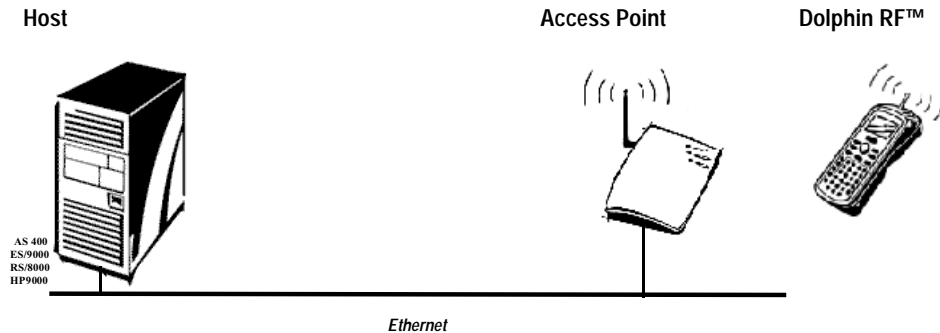
- Omnidirectional
- Patch
- Yagi

Host Connectivity

Hand Held Products offers several host connectivity options for Dolphin 7200 RF wireless LAN solutions. Direct Connect TN Client software is a thick-client solution that connects Dolphin 7200 RF™ computers directly to host applications via TN3270, TN5250 or TNVT terminal emulation using industry-standard TCP/IP protocol. Another option is a three-tier client server solution, or thin-client implementation, for 3270, 5250 and VT100/220 terminal emulation that uses a Universal Gateway. The Gateway establishes communication to a host such as an AS400 and maintains communication to both the Dolphin 7200 RF terminal and the host.

Thick-Client Terminal Emulation

PowerNet TN Client (telnet client) software allows the Dolphin 7200 RF terminal to communicate directly with applications running on AS/400, ES/9000, HP/6000 or other hosts connected to an Ethernet backbone and that support TCP/IP. The TNVT, TN3270, and TN5250 emulations use TCP/IP to communicate from the Dolphin 7200 RF™ terminal through the access point to the host. There is no network controller or server.

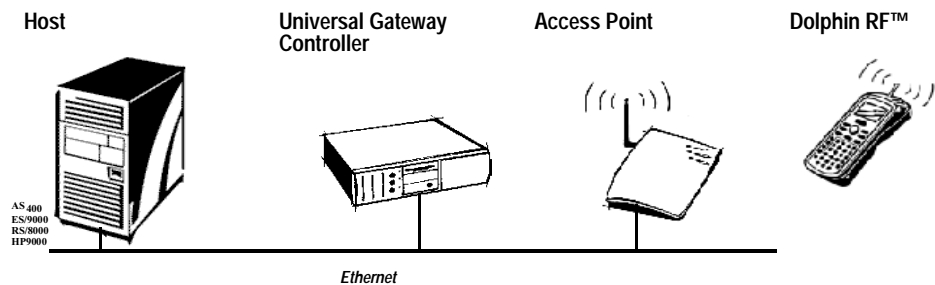
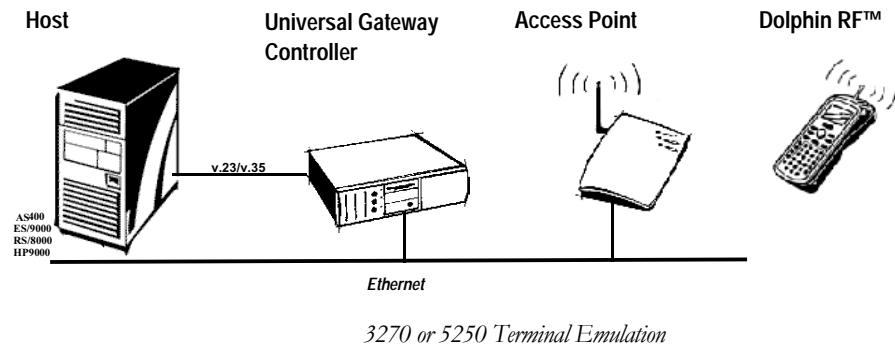


Telnet VT220, TN3270, or TN5250 Terminal Emulation with Direct Connect TN Client

For more information on thick-client terminal emulation, see the PowerNet TN for Dolphin 7200 RF User's Guide.

Thin-Client Terminal Emulation

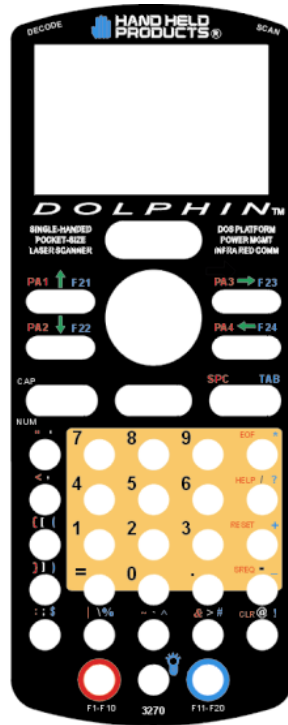
Hand Held Products' thin-client terminal emulation solution uses a Universal Gateway to provide host connectivity. The Universal Gateway connects to the hosts such as AS/400, ES/9000 and HP/6000 via Ethernet and communicates to the application via Ethernet for 3270, 5250 or telnet for DEC VT220 terminal emulation environments.



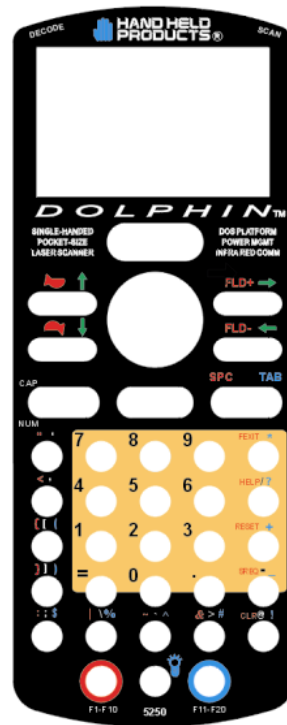
Telnet VT220, TN3270, or TN5250 Terminal Emulation with Universal Gateway Controller

Terminal Emulation Keyboard Overlays

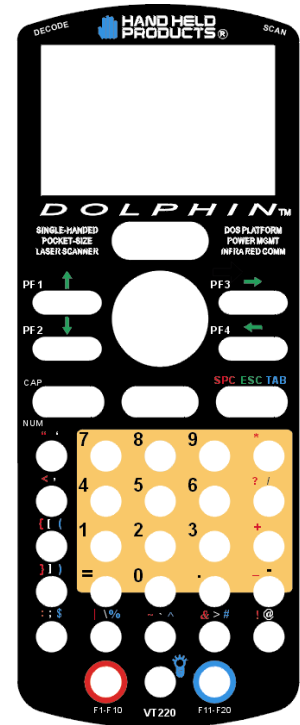
There are host-specific keyboard overlays supporting all necessary program keys, character sets, and control and display functions.



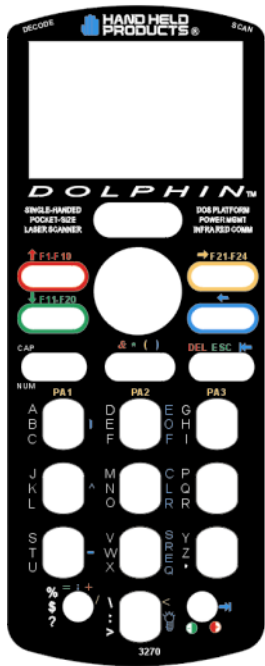
Alphanumeric 3270



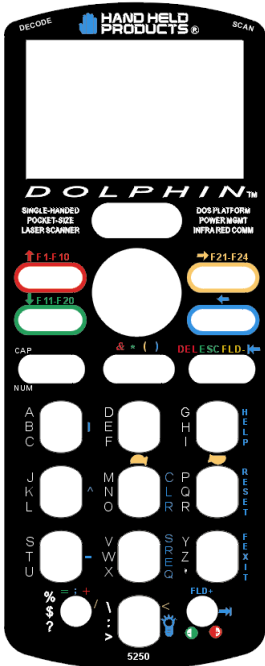
Alphanumeric 5250



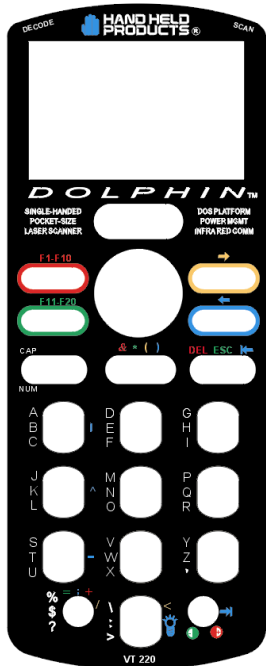
Alphanumeric VT220



Numeric 3270



Numeric 5250



Numeric VT220

Chapter 4 Dolphin™ 7200 with iButton Reader Handheld Computer

Describes the iButton reader and how to use it.

About Dolphin with iButton Reader Handheld Computer

The Dolphin with iButton Reader handheld computer integrates the basic functionality of the Dolphin Batch terminal with iButton™ technology that allows the terminal to read and write data from and to iButtons.

The iButton reader is a function and feature extension of the Batch terminal. Like the batch version, Dolphin iB can be equipped with up to 10 Mb of flash memory and will support all scan engine versions available for the Dolphin platform. Refer to Chapters 1 and 2 in this manual for more on basic operation of the Dolphin terminal and accessories available.

What is an iButton?



iButton technology was developed by Dallas Semiconductor. The iButton is a 16mm computer chip housed in a stainless steel can. The iButton can be worn by a person or attached to an object for up-to-date information at the point of use.

There are a variety of buttons with different features. Each starts with a guaranteed-unique registration number engraved in the silicon. Some buttons add computer memory to store typed text; information can be updated as often as needed with a simple, momentary contact.

Working with iButtons

In order to communicate with an iButton, the Dolphin iButton reader must make proper contact with the iButton during the time frame of the communication session. Intermittent contact can result in slow data communication or the need for re-attempts.



To transfer data between iButtons and Dolphin iButton reader:

Make sure that both the iButton and the iButton reader are clean and dry.

Touch the iButton reader against the iButton you want to communicate with. The reader and the iButton must have full surface-to-surface contact for data transfer to be completed.

Keep the iButton reader touched against the iButton until the application generates a beep or displays a message on the Dolphin's screen indicating the data transfer is completed.

IButtons supported by Dolphin with iButton Reader

The types of iButtons that Dolphin iButton reader may read and write data to depends on the software development tools used.

Read/write iButton types that Dolphin iButton reader can read/write to include:

- DS 197X range EEPROM Devices
- DS 199X range NVRAM devices (with the exception of DS1990A, which is read only)
- DS 1954 Crypto iButton
- DS 1963 Monetary iButton

Compatible read-only iButton types that Dolphin iButton reader can read include:

- DS 1990A Serial number iButton
- DS 1920 Temperature iButton

Compatible read/write iButtons that the Dolphin iButton reader can read include:

- DS 198X EPROM devices

Developing Applications with Dolphin with iButton Reader

Hand Held Products has a Software Developer's Kit (SDK) that includes the following:

1. API for iButton functions that support the most commonly used iButton types and concern file handling and data manipulation of iButton specific features. May be used in conjunction with Dolphin Development System.
2. Demo software and source code examples

Note: In addition, developers need the MicroSoft C/C++ or Borland C/C++ compiler.

Chapter 5 Dolphin™ 7200 with Image-Capture Handheld Computer



About Dolphin 7200 with Image-Capture™ Handheld Computer

The Dolphin 7200 Image-Capture handheld computer incorporates a low-power, high-resolution camera to electronically capture and store images such as signatures, airbills, and damaged cartons. The terminal can also be used to also scan barcodes when equipped with a laser scanner.

A CMOS (complementary metal oxide semiconductor) camera is mounted inside the Dolphin terminal next to the laser scanner making the ergonomics of using the camera similar to using the scanner.

The Dolphin Image-Capture handheld computer can easily hold a minimum of 100 signatures with the Dolphin's standard memory configuration of 2 MB RAM and 2 MB non-volatile FLASH memory. Images can be compressed and stored using industry-standard data compression technologies. The device provides the flexibility to store either images that contain grayscale information or black and white only information. Images can be downloaded via HomeBase™ or VehicleBase™ communication cradles and then transmitted via one of many wired or wireless options.

The device is equipped to capture images in total darkness with its own lighting source.

The CMOS camera is a function and feature extension of the Dolphin platform. Like the batch version, Dolphin Image-Capture can be equipped with up to 10 MB of flash memory for data and application storage. Dolphin Image-Capture handheld computer also supports all scan engine versions available for the Dolphin platform. Refer to Chapters 1 and 2 in this manual for more on basic operation of the Dolphin terminal and accessories available.

Capturing Images

The image-capture process is a split-second operation for experienced users. By following the basic guidelines, new users can easily develop their own technique and, with practice, quickly learn to adapt it to different circumstances. The basic steps for acquiring images using the Dolphin Image-Capture terminal are:

1. To aim, hold the Dolphin terminal horizontally at a 90° angle approximately 3 to 12 inches away from the target. You may have to adjust the angle at which you hold the Dolphin if there is glare on the screen.

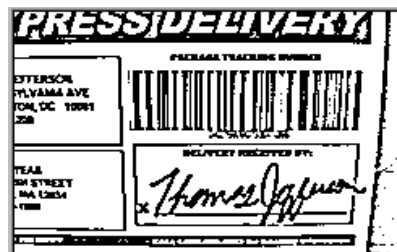
2. Press the **ON/SCAN** button to take an image. Use the live video image on the terminal screen as a guide for positioning and aiming the terminal at the target. You may find it helpful to start by moving the terminal further away and then in closer to the target. The active screen image will have a slightly degraded appearance compared to the captured image. This is normal.
3. Release the **ON/SCAN** button to capture the image when the desired image is displayed on the terminal screen. Hold the Dolphin terminal as still as possible when capturing the image.

The image quality and related file size is determined by the data compression method used by your software application. For highest quality, take grayscale images. When saved, the image will be saved in JPEG file format. The size of the file depends on the information content of the image and will be approximately 5-10K.



Grayscale Image

Images may also be saved in a file type that contains black and white information only. The file is saved in GIF file format and will be (approximately 1.5 to 2K).



Black and White Image

Lighting Conditions

Dolphin Image-Capture terminal is equipped with an internal lighting source to allow users to take images in dim light conditions. It is suggested that you turn on the unit's electroluminescent backlight when taking images in extreme low light conditions to help with aiming.

Dolphin Image-Capture Demo Software

Images taken with the Dolphin Image-Capture demonstration program may be downloaded from the terminal to your host computer via HomeBase™ or VehicleBase™ communication cradles using the Dolphin Image-Capture Host Software that ships with the terminal. The host software package works with the Dolphin Image-Capture client demo software for a complete demonstration of the terminal's capabilities.

The Dolphin Image-Capture Demo Software allows you to collect images with the Dolphin Image-Capture terminal, transfer image files to a PC-based host and view the collected images.

The software consists of the following components:

For the Host:

1. Dolphin Image-Capture Server (ICDserver.EXE)

Communication and viewer module. The module allows you to receive images from the Dolphin and display the transmitted image. Once an image is transmitted correctly, it can be printed or stored on the local hard drive.

2. Dolphin Image-Capture Viewer

Dolphin Image-Capture Viewer allows you to view and print saved images.

3. Dolphin Image-Capture Application (ICDapp.EXE)

By selecting the **F4** option on the Dolphin ICD client, the user can collect multiple bar codes and images. The application allows you to merge a scanned bar code with the image you take. The ICD application module ensures that all barcode data and images will be transmitted and saved to the local hard drive correctly. The ICD application module includes a viewer that allows you to view the collected images with corresponding bar code data.

For the Dolphin:

4. ICD client (ICD.EXE)

This program runs on the Dolphin terminal and works in conjunction with the ICD server and ICD application. The ICD client allows you to take images, select the file type in which to save images read bar codes and transmit data to the host.

Installing the Dolphin Image Capture Demo Software on the Host


The Dolphin Image-Capture Demo Software (ICDS) is shipped with the Dolphin Image-Capture terminal.

System requirements for the Dolphin ICDS host components are:

Operating system: Windows 95, Windows 98 or Windows-NT

Free disk space: 1.2 MB

To load the program on your PC:

1. Follow the instructions on the diskette label and software installation program.
2. After successful installation, run the program by selecting the  icon.

Before transmitting images, ensure that the proper COM port and baud rate have been selected. The default is 56700.

Instructions for selecting the COM port and setting the baud rate for the host software and HomeBase are found in the next section under Settings Menu.

HHP Dolphin Image Capture Server Application



HHP Dolphin Image Capture Server

Note:: The image shown above was captured using the Dolphin Image-Capture handheld computer.

This application is designed to work with the **F2 – IMAGE CAPTURE** option of the Dolphin Image-Capture client demonstration program. The Image Capture Server software must be running on your PC before taking any images. If the program is not open when you put the terminal in the HomeBase, the Dolphin cannot transfer the file to the host. After transmission from Dolphin to the host, the image and its file size is displayed in the window as shown above.

File Menu

Page Set-up

Select this option to set print options.

Print

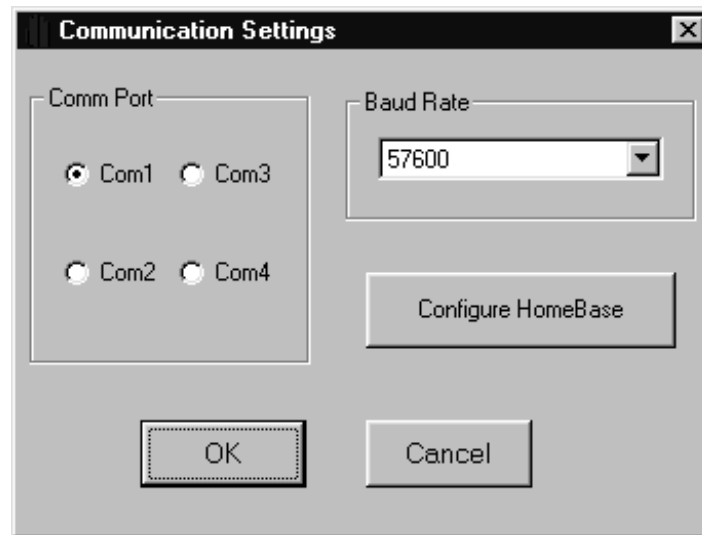
Select this option to print the current image.

Exit

Select this option to exit the program.

Settings Menu

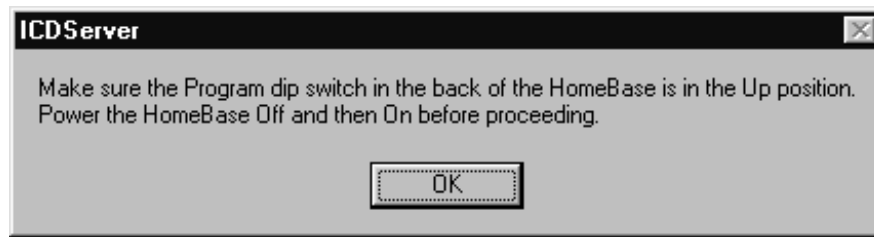
The Communication option on the Settings menu allows you to configure the HomeBase for communications and select the COM port on your computer. To transfer images taken with Dolphin Image-Capture terminal, the HomeBase must be configured at 57600 baud rate.



Communications Settings Dialog Box

Follow these steps to configure HomeBase:

1. In Comm Port dialog box, select the Com port to which the HomeBase is connected.
2. Select 57600 Baud Rate.
3. Click Configure HomeBase. When you perform this action, the following message will appear on the screen:



4. Follow the directions in the dialog box and then click OK.
5. The HomeBase configuration process will begin. When finished, click OK and the Communications Settings dialog box will close.

About

When you click the About option on the menu, the following box will appear to show the version number of your software.





Buttons

View Images

Select this button to open the Dolphin IC Saved Image Viewer program to view saved images.

Save Image

Select this button to save an image to the Saved Image Viewer.

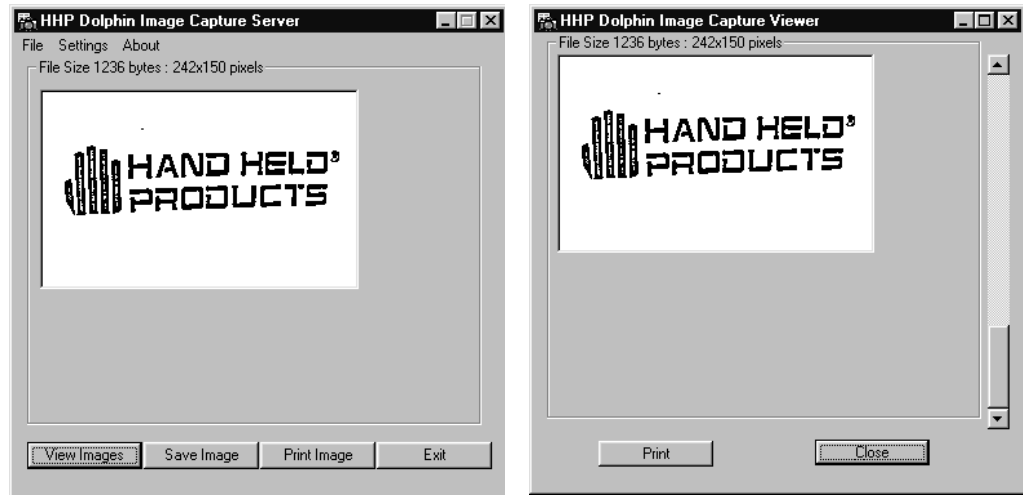
Print

Select this button to print an image. You do not have to save an image to print it.

Exit

Select this button to exit the program. Save image before exiting the program.

Dolphin Image Capture Viewer



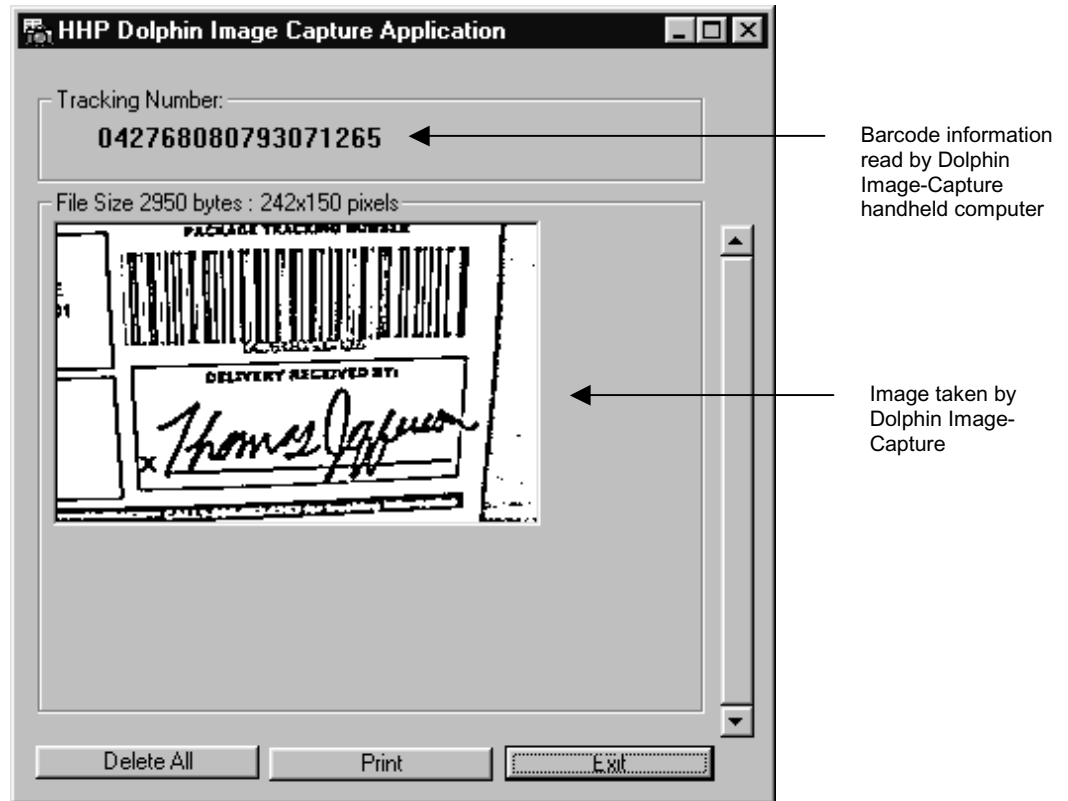
HHP Dolphin Image Capture Server and HHP Dolphin Image Capture Viewer

When you select the **View Images** button, the Image Capture Viewer program opens. The program allows you to view images saved in the HHP Dolphin Image Capture Server Application. Navigate the scroll bar to find the image you want to view. Select the **Print** button to print the image.

To delete images from the viewer:

2. Open Windows Explorer
3. Go to and open ICDemo folder on host C: drive
4. Open the Save subfolder. This is where image files are saved.
5. Highlight the image files you want to delete and touch the **Delete** key.

Dolphin Image Capture Application



HHP Dolphin Image-Capture Application

The HHP Dolphin Image-Capture Application Demonstration works with the **F4 - Package Deliver** option of the Dolphin client software.

After files have been downloaded from the terminal via HomeBase, the application window displays the tracking numbers scanned and images taken during the demo. If you have taken several images, move the navigation bar on the right side of the window up and down, as needed, to view the images.

Delete All

Select this option to delete all images taken during the demonstration.

Print

Select this option to print the image shown in the program window.

Exit

Select this option to exit the program.

Dolphin Image-Capture Client Demonstration Software

The Dolphin Image-Capture terminal is shipped loaded with client demonstration software.

If the demonstration program has been removed from your terminal, follow these steps to install:

1. Check to make sure that HomeBase is set at 57600 baud rate on the PC.
2. Click Windows Start button and go to Programs.
3. Select the Dolphin Image Capture Program Group.
4. Select Upload ICD Client Com 1 or Upload ICD Client Com 2.
5. Place the Dolphin terminal in the HomeBase.
6. On the Dolphin terminal, go to the DOS prompt and type YFF and press ENTER to transfer the files.
7. After successful transfer, type ICD and then press <ENTER> at the DOS prompt.

Main Menu

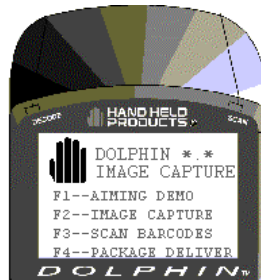


Image Capture Demo Program Main Menu

F1 AIMING DEMO

This demo allows the user to practice aiming only, with the Dolphin with *Image-Capture* terminal. Press F1 and follow the directions on the screen. This option does not store images on the terminal's disk.



F1 Aiming Demo Screen

F2 IMAGE CAPTURE

This option allows the user to select the image file type, take an image and transmit it to from the Dolphin terminal to the host computer.



F2 Image Capture Demo Menu

F1 BW /Crop

Select this option to take images that are cropped and contain only black and white information. The image acquired is basically what you see on the terminal screen. Using this option yields images with the smallest file sizes. The pixel size of the image when cropped is 242 x 150 pixels.

Note: Cropping is the process of removing some percentage of the border of the image. Cropping reduces the number of pixels the image contains and therefore decreases the final image file size.

F2 B/W

Select this option to take uncropped black and white images. Using this option yields a larger image with more informative content than what you see on the Dolphin display. The pixel size of the image is 310 x 236 pixels.

F3 GRAY /Crop

Select this option to take cropped grayscale images. The image size acquired is what you see on the terminal screen. Grayscale images have larger file sizes than black and white images, as the information content is greater.

F4 GRAY

Select this option to take uncropped grayscale images. Images taken with this option have the largest file sizes. Using this option yields a larger image than what you see on the Dolphin display.

Capturing Images

After you have selected the compression and cropping option and opened the Dolphin Image Capture server program on your PC, follow these screen prompts to capture an image.

1.



Scan Image Screen

Press the ON/SCAN key, aim and release it to take an image. After you scan the image, the terminal will beep, the screen will go blank momentarily and the image taken will appear on the screen. If the image is acceptable, press the ENTER key to save the image and proceed to the next step. If the image is not satisfactory, press the ON/SCAN key to take a new image. Repeat as necessary to acquire the desired image and proceed to the next step.

2. The following screen will appear:



3. Place the terminal in the HomeBase to begin transferring the file to your host computer. Note: You must put the terminal into the HomeBase within 15 seconds of taking the image. Otherwise, the image will be deleted and you will have to retake the image.



HomeBase Screen

4. The file transfer status screen will appear on the Dolphin terminal after you place it in the HomeBase.



File Transfer Status Screen

5. After the transfer is complete, Dolphin Image-Capture terminal is ready to take another image.

Note: Be sure that the Dolphin Image Capture Server program is running on your PC before taking any images. If the program is not running when you put the terminal in the HomeBase, Dolphin cannot transfer the file to the host and you will see the following screen:



To begin the process, leave the Dolphin terminal in the HomeBase and open the Dolphin Image Capture Server program. The file transfer process will occur as described in Steps 4 and 5 above.

F3 SCAN LABELS

Press ON/SCAN Button to scan label. This option only demonstrates how the terminal scans bar codes.



F3 Scan Labels Menu

F4 PACKAGE DELIVER

This menu option opens a package delivery demonstration application. The demonstration shows how the Dolphin IC computer's image capture and barcode scanning functions are well-suited for delivery confirmation applications. These dual functions link the signature with the barcode information for real proof of delivery.

Note: By default, images taken with this demonstration will be black and white with cropping. If you want to use another file type, follow these steps:

1. *Select F2 – Image Capture from the Dolphin Image Capture main menu.*
2. *Select the image type.*
3. *Press SHIFT + BKSP to return to the Dolphin Image Capture main menu.*



F4 Package Deliver Demonstration Scan Tracking Number

Follow these steps to use the package delivery demonstration:

1. Press the **ON/SCAN** button to scan a barcode. The terminal beeps to signal a successful scan. You can also manually enter a tracking number using the keypad.

Press **ENTER** and the terminal will beep to indicate that you have successfully entered the tracking number.

2. The screen shown below will appear. Press and hold the **ON/SCAN** key to take an image or signature. Release the **ON/SCAN** key when the desired image is displayed on the Dolphin terminal's screen. The terminal will beep, the screen will go blank momentarily and the image taken will appear on the screen. If the image is acceptable, press the **ENTER** key to save the image and proceed to the next step. If the image is not satisfactory, press the **ON/SCAN** key to take a new image. Repeat as necessary to acquire the desired image and proceed to the next step.



Scan Screen

3. After you have saved the image, the following screen will appear on the Dolphin display:



Saving Image Screen

4. When the image is saved, the terminal beeps and returns to the Package Deliver demo screen shown below and is ready for the next tracking number.



F4 Package Delivery Demonstration Menu

5. Place the Dolphin with *Image-Capture* terminal into the HomeBase to transfer the captured signature and barcode information to your PC via the Host Download Software Program. After the files are downloaded, the terminal returns to the Dolphin *Image-Capture* demo program's main menu.
6. On your PC, select the Dolphin Image Capture Application window.

Note: Be sure that the Dolphin Image Capture Server program is running on your PC before taking any images. If the program is not running when you put the terminal in the HomeBase, the Dolphin cannot transfer the file to the host and you will see the following screen:



To begin the process, leave the Dolphin terminal in the HomeBase and open the program. The file transfer process will occur as described in Steps 4 and 5 above.

Chapter 6 Dolphin 7200 2D Terminal



About the Dolphin 7200 2D Hand Held Computer

The Dolphin™ 7200 2D handheld computer features the IMAGETEAM™ 4250 Image Engine, a low power, high-resolution digital image engine for omni-directional and auto-discrimination reading and decoding of linear barcodes, stacked linear (PDF417) and 2D matrix codes. The image engine functions like a digital camera and also provides OCR (Optical Character Recognition) functionality.

The terminal is available in several configurations with alpha/numeric and numeric keyboard options. These configurations include the standard range image engine with 2MB RAM and 2MB non-volatile FLASH memory or 2MB RAM and 8MB non-volatile FLASH memory. A high-density image engine with the same memory options is also available integrated into the terminal.

Like the Dolphin 7200 with Image Capture terminal, the 2D terminal also has image lift capabilities for signature capture and proof of delivery applications. Images taken with the unit can be compressed and stored using industry-standard data compression technologies. The device provides the flexibility to store either images that contain grayscale information or black and white only information. Images can be downloaded via HomeBase™ or VehicleBase™ communication cradles and then transmitted via one of many wired or wireless options.

The terminal is also able to decode barcode symbologies and capture images in dim lighting conditions or complete darkness.

Supported Symbologies

1D linear codes:

Code 3 of 9, Interleaved 2 of 5, Code 11, IATA 2 of 5, MSI, UPC A, UPC EO, UPC EI, EAN/EAN13, Codabar, Code 128, Code 93, UPC

2D codes:

PDF417, microPDF, Maxicode, Datamatrix, Aztec, QR Code, Code 49

Composite codes:

RSS-14, CODABLOCK, AZTEC MESA

OCR codes (Optical Character Recognition):

OCR A and OCR B

Postal Codes:

Postnet and most international 4 state codes, PLANET CODE, BPO 4 STATE, CANADIAN 4 STATE, DUTCH POSTAL, AUSTRALIAN 4 STATE, JAPANESE POSTAL

For other supported symbologies, please see the IMAGETEAM™ 4250 User's Guide.

Reading Barcodes

The omni-directional scanning capabilities of the Dolphin 7200 2D terminal greatly simplify operation and training and increase productivity. To read a bar code:

1. Press the ON/SCAN button to project the scanner's bright red aiming beam
2. Center the aiming beam over the barcode. The red SCAN LED illuminates when the user presses the ON/KEY key and the green DECODE LED illuminates when a bar code is successfully decoded. **The aiming beam can be positioned in any direction for a good read.**

Linear bar code



2D Matrix symbol



The aiming beam is smaller when the terminal is held closer to the code and larger when it is farther from the code. Symbologies with smaller bars or elements (mil size) should be read closer to the unit. Symbologies with larger bars or elements (mil size) should be read farther from the unit.

Capturing Images

The image-capture process is a split-second operation for experienced users. By following the basic guidelines, new users can easily develop their own technique and, with practice, quickly learn to adapt it to different circumstances. The basic steps for acquiring images using the Dolphin 7200 2D terminal are:

1. To aim, hold the Dolphin terminal horizontally at a 45° angle approximately 2 to 9 inches (5 to 20 cm) away from the target. You may have to adjust the angle at which you hold the Dolphin if there is glare on the screen.
2. Press the **ON/SCAN** button to take an image. Use the live video image on the terminal screen as a guide for positioning and aiming the terminal at the target. You may find it helpful to start by moving the terminal further away and then in closer to the target. The active screen image will have a slightly degraded appearance compared to the captured image. This is normal.
3. Release the **ON/SCAN** button to capture the image when the desired image is displayed on the terminal screen. Hold the Dolphin terminal as still as possible when capturing the image.

The image quality and related file size is determined by the data compression method used by your software application. For highest quality, take grayscale images. When saved, the image will be saved in JPEG file format. The size of the file depends on the information content of the image and will be approximately 4-8 K.

Lighting Conditions

The Dolphin 7200 2D terminal is designed to read bar codes and take images in dim light conditions. It is suggested that you turn on the unit's electroluminescent display backlight when taking images in extreme low light conditions to help with aiming.

Dolphin 7200 2D Demo Software

The Dolphin 7200 2D terminal demonstration software program allows you to show how the terminal omni-directionally decodes all popular linear and 2D barcodes and OCR as well as its image capture capabilities.

The software consists of two components – one that runs on the host computer and one that runs on the Dolphin terminal.

Installing the Dolphin 7200 2D Demo Software on the Host

The host computer demonstration software for the Dolphin 7200 2D hand held computer is the same program used for the Dolphin 7200 Image-Capture terminal. For information on using the host computer demonstration software, see the sections on *Installing the Dolphin Image-Capture Demo Software on the Host* and the *HHP Dolphin Image-Capture Server Application* in Chapter 5 of this manual.

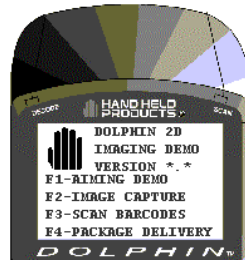
Installing the Dolphin 7200 2D Demo Software on the Dolphin Terminal

The Dolphin 7200 2D terminal is shipped loaded with client demonstration software.

If the demonstration program has been removed from your terminal, follow these steps to install:

1. Check to make sure that HomeBase is set at 57600 baud rate on the PC.
2. Click Windows Start button and go to Programs.
3. Select the Dolphin Image Capture Program Group.
4. Select Upload ICD2D Client Com 1 or Upload ICD2D Client Com 2.
5. Place the Dolphin terminal in the HomeBase.
6. On the Dolphin terminal, go to the DOS prompt and type YFF and press ENTER to transfer the files.
7. After successful transfer, type ICD2D and then press <ENTER> at the DOS prompt.

Main Menu



Dolphin 2D Imaging Demo Program Main Menu

F1 AIMING DEMO

This demo allows the user to practice aiming only, with the Dolphin 7200 2D terminal. Press F1 and follow the directions on the screen. This option does not store images on the terminal's disk.



F1 Aiming Demo Screen

F2 IMAGE CAPTURE

This option allows the user to select the image file type, take an image and transmit it to from the Dolphin terminal to the host computer.



F2 Image Capture Demo Menu

F1 B/W/Crop

Select this option to take images that are cropped and contain only black and white information. The image acquired is basically what you see on the terminal screen. Using this option yields images with the smallest file sizes. The pixel size of the image when cropped is 242 x 150 pixels.

Note: Cropping is the process of removing some percentage of the border of the image. Cropping reduces the number of pixels the image contains and therefore decreases the final image file size.

F2 B/W

Select this option to take uncropped black and white images. Using this option yields a larger image with more informative content than what you see on the Dolphin display. The pixel size of the image is 310 x 236 pixels.

F3 GRAY/Crop

Select this option to take cropped grayscale images. The image size acquired is what you see on the terminal screen. Grayscale images have larger file sizes than black and white images, as the information content is greater.

F4 GRAY

Select this option to take uncropped grayscale images. Images taken with this option have the largest file sizes. Using this option yields a larger image than what you see on the Dolphin display.

Capturing Images

After you have selected the compression and cropping option and opened the Dolphin Image Capture server program on your PC, follow these screen prompts to capture an image:

1.



Scan Image Screen

Press the ON/SCAN key, aim and release it to take an image. After you scan the image, the terminal will beep, and the image taken will appear on the screen. If the image is acceptable, press the ENTER key to save the image and proceed to the next step. If the image is not satisfactory, press the ON/SCAN key to take a new image. Repeat as necessary to acquire the desired image and proceed to the next step.

2. The following screen will appear:



3. Place the terminal in the HomeBase to begin transferring the file to your host computer. *Note: You must put the terminal into the HomeBase within 15 seconds of taking the image. Otherwise, the image will be deleted and you will have to retake the image.*



HomeBase Screen

4. The file transfer status screen will appear on the Dolphin 7200 2D terminal after you place it in the HomeBase.



File Transfer Status Screen

5. After the transfer is complete, the Dolphin 7200 2D terminal is ready to take another image.

Note: Be sure that the Dolphin Image Capture Server program is running on your PC before taking any images. If the program is not running when you put the terminal in the HomeBase, Dolphin cannot transfer the file to the host and you will see the following screen:



To begin the process, leave the Dolphin terminal in the HomeBase and open the Dolphin Image Capture Server program. The file transfer process will occur as described in Steps 4 and 5 above.

F3 SCAN LABELS

This option only demonstrates how the terminal scans bar codes. Press F1 to configure the Dolphin 7200 2D to read linear barcodes, stacked linear and matrix codes. As each symbology is configured, its name will appear in a scrolling list on the screen. Once the terminal is configured, press the ON/SCAN Button to scan a bar code.



F3 Scan Labels Menu

F4 PACKAGE DELIVERY

This menu option opens a package delivery demonstration application. The demonstration shows how the Dolphin 7200 2D computer's image capture and barcode scanning functions are well-suited for delivery confirmation applications. These dual functions link the signature with the barcode information for real proof of delivery.

Note: By default, images taken with this demonstration will be black and white with cropping. If you want to use another file type, follow these steps:

1. Select F2 – Image Capture from the Dolphin 2D Imaging main menu.
2. Select the image type.
3. Press **SHIFT + BKSP** to return to the Dolphin 2D Imaging main menu.



F4 Package Delivery Demonstration Scan Tracking Number

Follow these steps to use the package delivery demonstration:

1. Press the **ON/SCAN** button to scan a barcode. The terminal beeps to signal a successful scan. You can also manually enter a tracking number using the keypad. Press **ENTER** and the terminal will beep to indicate that you have successfully entered the tracking number.
2. The screen shown below will appear. Press and hold the **ON/SCAN** key to take an image or signature. Release the **ON/SCAN** key when the desired image is displayed on the Dolphin terminal's screen. The terminal will beep, the screen will go blank momentarily and the image taken will appear on the screen. If the image is acceptable, press the **ENTER** key to save the image and proceed to the next step. If the image is not satisfactory, press the **ON/SCAN** key to take a new image. Repeat as necessary to acquire the desired image and proceed to the next step.



Scan Screen

- After you have saved the image, the following screen will appear on the Dolphin display:



Saving Image Screen

4. When the image is saved, the terminal beeps and returns to the Package Deliver demo screen shown below and is ready for the next tracking number.



F4 Package Delivery Demonstration Menu

5. When you are ready to transfer the captured signature and bar code information to your PC via the Host Download Software Program, press F1 and place the Dolphin 7200 2D terminal into the HomeBase. After the files are downloaded, the terminal returns to the Dolphin *Image-Capture* demo program's main menu.
6. On your PC, select the Dolphin Image Capture Application window.

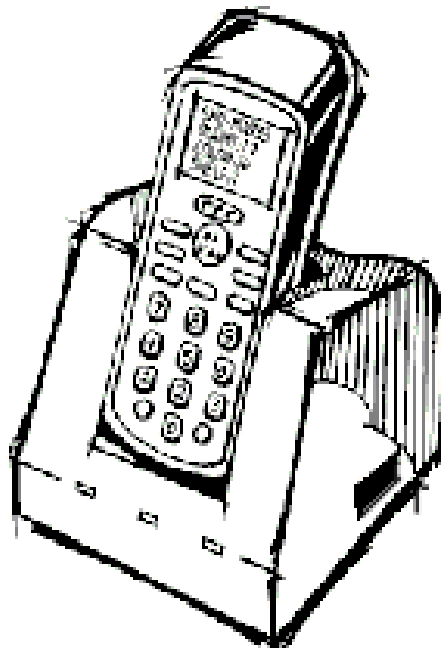
Note: Be sure that the Dolphin Image Capture Server program is running on your PC before taking any images. If the program is not running when you put the terminal in the HomeBase, the Dolphin cannot transfer the file to the host and you will see the following screen:



To begin the process, leave the Dolphin terminal in the HomeBase and open the program. The file transfer process will occur as described in Steps 4 and 5 above.

Chapter 7 Using the Dolphin 7200 HomeBase

Summarizes the features of the Dolphin 7200 HomeBase and explains how to use it.



Hub of the System

As the hub of your Dolphin system, the Dolphin 7200 HomeBase performs three important functions – battery management, communications and storage.

Battery Management

The Dolphin 7200 HomeBase uses a charging method that senses when the battery pack is fully charged and then drops to a trickle charge to keep the battery pack at full capacity. The battery pack does not need to be discharged before recharging because this method protects the battery from damage caused by overcharging.

IrDA Optical Communications

The IR communications port on the HomeBase connects with the IrDA port on the Dolphin. Reliable data communications at speeds of up to 115 baud can be transmitted by the HomeBase. With no pins or contacts to break, IrDA will work reliably for years.

The Dolphin 7200 HomeBase can be networked together for mass programming and charging. Units are individually addressable, allowing each HomeBase to be automatically loaded with the right information and files for its user.

Convenient Storage

The Dolphin 7200 HomeBase is a safe and convenient storage receptacle for the Dolphin terminal. The HomeBase also holds a spare charged battery pack.

Dolphin 7200 HomeBase Parts and Functions

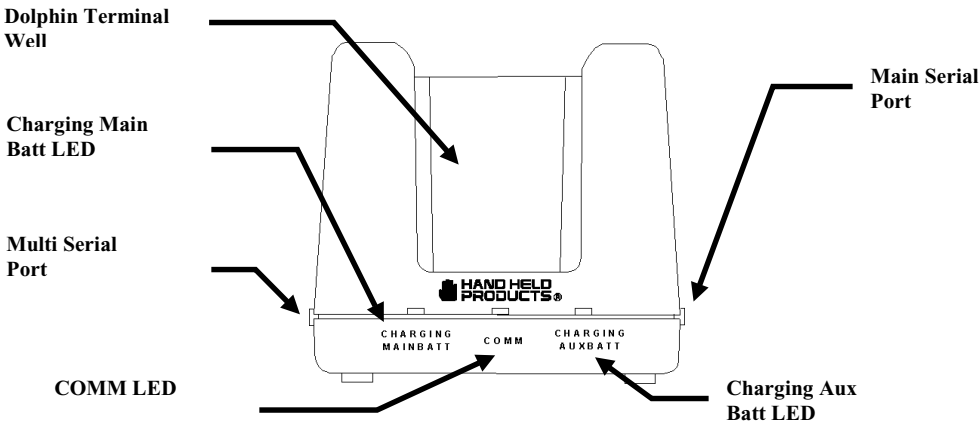


Figure 8 HomeBase Front Panel

Front Panel

The Dolphin's front panel has one slot:

Dolphin Terminal Well You put the Dolphin in this well to communicate with a host device and to charge the Dolphin's batteries.

LEDs There are three LEDs that you can use to monitor the status of battery charging and communications status:

- 1. Charging Main Batt LED** Turns solid green when the Dolphin Terminal is properly seated into the Dolphin HomeBase.
- 2. COMM LED** Indicates the status of data transfer between the Host Device and the Dolphin Terminal as described below:

Comm LED	Description
Red LED	Data is being sent from the Host Device to the Dolphin HomeBase.
Green LED	Data is being sent from the Dolphin HomeBase to the Host Device.
Orange LED	Data is being sent at high data rates.

Figure 9 Data Transfer States

- 3. Charging Aux Batt LED** Indicates the status of the auxiliary battery pack in the Dolphin HomeBase as described in the table below:

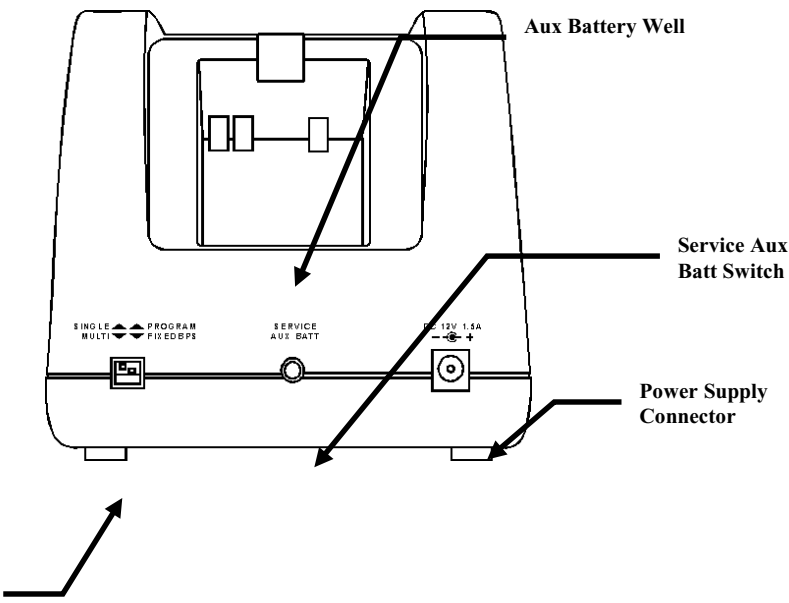
NOTE

The Charging Main Batt LED does not indicate the battery status of the Dolphin terminal.

Charging Aux Batt LED	Description
OFF	Battery pack not properly inserted into the auxiliary battery well, or the HomeBase has no power
Red	Battery discharging
Blinking red LED	Charge cycle initializing
Blinking orange LED	Battery charging at the maximum rate
Solid green LED	Trickle charging; battery pack is ready for use

Figure 10 Battery Charging States

Back Panel



NOTE

The configuration switches are checked at power up. Changes in the switch settings will not be recognized until power is turned off and then back on.

There is an auxiliary power supply connector.

Figure 11 Back Panel of HomeBase

charge button, and a

Auxiliary battery well Insert a battery into the well to charge a second battery and you will always have a spare. The auxiliary battery well can also service your battery pack.

Configuration switches Use these switches to select the network and communications modes for your Dolphin. See Chapter 8 for more on the configuration switch settings.

Service Aux Batt switch Press and hold this button for four seconds to service the battery in the auxiliary battery well. For maximum battery life, the battery should be serviced, or calibrated once a month. The Charging AUX BATT LED is red while the battery is discharging and changes to blinking red when the charging cycle begins. The battery is ready to use when the light turns green.

Power supply connector Use this connector to attach a power supply to the HomeBase. The power supply provides 12V DC input for communications and battery charging.

Side Panels

There is a main communications port on one side and a multi-HomeBase-port on the other side:

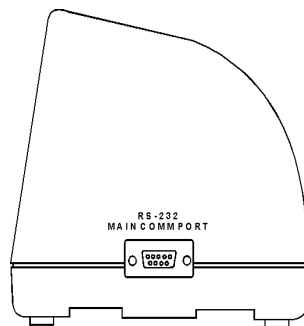


Figure 12 HomeBase Side Panel Main Communications Port

Main Communications Port Use a standard serial cable to connect this port to a host RS-232 device if the Dolphin HomeBase is the first unit of HomeBase network. Otherwise, the main communications port connects to another Dolphin HomeBase Multi-HomeBase Port to form a daisy-chained network. See pinout definitions in the section on *Setting Up the Dolphin HomeBase* later in this chapter.

Multi-HomeBase Port Use this port to form a Dolphin HomeBase Network. This port mates with the next HomeBase's main communications port to form an addressable network. *Note: The Multi-HomeBase Port cannot be used for communications to standard serial devices.*

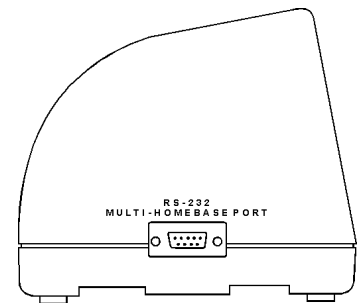


Figure 13 HomeBase Side Panel Multi-HomeBase Port

Charging Batteries In The Dolphin 7200 HomeBase

CAUTION: Use only the 3.6V battery packs provided by Hand Held Products. The use of any other battery pack in the Dolphin Terminal will void your warranty and may result in damage to the Dolphin Terminal or battery.

NOTE

*For maximum battery life, Hand Held Products recommends that you deep-cycle (service) the battery **twice** before initial use and then, once a month thereafter.*

With the Dolphin HomeBase, you can charge a Dolphin terminal and a spare NiMH battery pack simultaneously. The HomeBase charges the terminal and the spare battery pack independently.

When you insert a battery into the Dolphin HomeBase, it charges the battery at the highest rate possible. The HomeBase uses a charging method that senses when the battery pack is fully charged and then drops to a trickle charge to keep the battery pack at full capacity. You do not need to discharge the battery pack before recharging because this method protects the battery from damage caused by overcharging. A dead battery will charge to full capacity in approximately three hours.

The Dolphin Terminal can be stored indefinitely in the HomeBase without damage to the terminal, battery packs, or the HomeBase. Keep the HomeBase plugged in so that the Dolphin Terminal's battery pack stays fully charged.

Charging A Dolphin Terminal

1. Insert a battery pack into the Dolphin Terminal.
2. Place the terminal, laser engine window up and the LCD visible, in the Dolphin Terminal Well of the Dolphin HomeBase.
3. Let it glide down into the well until it stops.
4. Once the Dolphin Terminal is properly seated, the Charging Main Batt LED on the HomeBase will be solid GREEN.

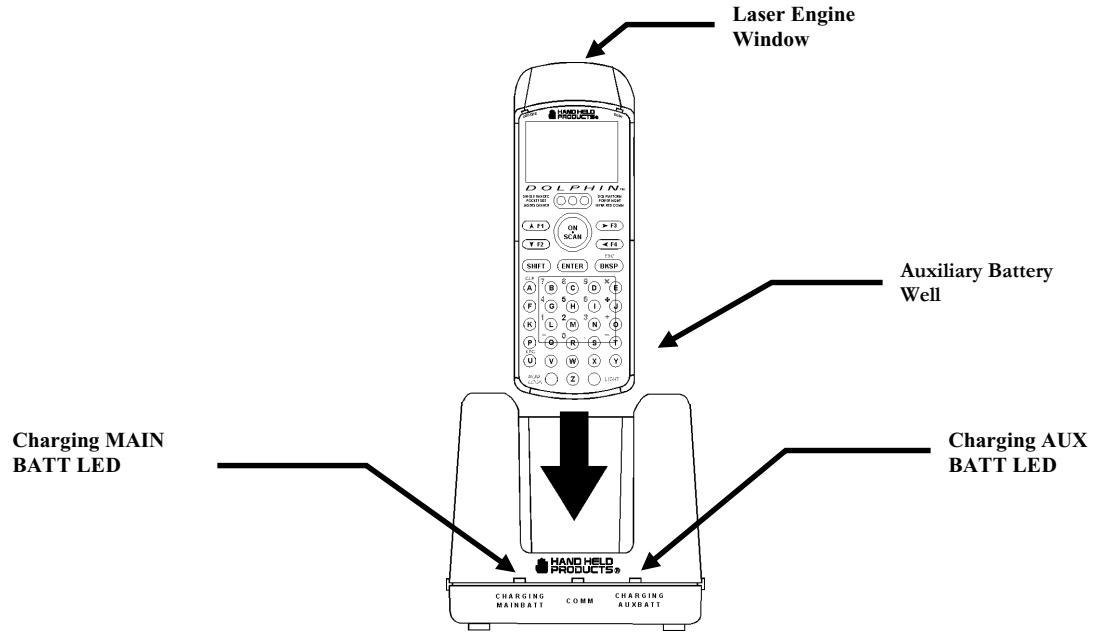


Figure 14 Inserting the Dolphin terminal into the HomeBase

Charging an Additional NiMH Battery Pack

1. Insert an NiMH battery pack with the battery contacts pointing upward into the Dolphin HomeBase auxiliary battery well.

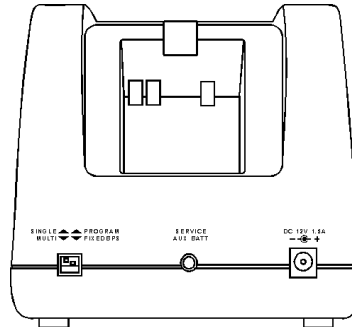


Figure 15 Rear View Dolphin HomeBase

Once the battery is inserted into the Dolphin HomeBase you can use the CHARGING AUXBATT LED to monitor the charging progress. See Figure 10 for a summary of each charging state.

Deep-cycling the Battery

For maximum battery life, Hand Held Products recommends that you deep-cycle (service) the battery **twice** before initial use and then, once a month thereafter. To deep-cycle, insert the battery into the HomeBase auxiliary battery well. Then, push and hold the **Service Aux Batt** button for at least 4 seconds. The deep-cycling process takes approximately 6.5 hours.

The CHARGING AUXBATT LED is red while the battery is discharging and changes to blinking red when the charging cycle begins and orange when charging at the maximum rate. The battery is ready to use when the light turns green. See Figure 10 for more on the LED status.

Setting Up For Communications

The Dolphin Terminal and Dolphin HomeBase support RS-232 communications through the RS-232 Main Communications Port located on the side of the Dolphin 7200 HomeBase. The HomeBase translates the RS-232 signals from the host computer into infrared signals to communicate with the Dolphin Terminal.

The HomeBase RS-232 interface allows the Dolphin Terminal to communicate to a personal computer, modem, or any standard RS-232 device using a standard serial cable and communications software.

Follow these steps to set up the Dolphin HomeBase and Dolphin Terminal for communications:

1. Set up the Dolphin HomeBase.
2. Set-up the Dolphin Terminal.
3. Follow the data transfer sequence as described by your application.

Setting up the Dolphin HomeBase

Set the Dolphin HomeBase on any dry, stable surface such as a desktop. Before mounting the Dolphin HomeBase, check to ensure that all AC wall transformers have a nearby electrical outlet. Be sure to provide enough workspace with good lighting for the user to view and operate the Dolphin Terminal while it is in the HomeBase. Setting up the HomeBase involves three steps:

1. Connecting the cables
2. Setting the configuration switches
3. Setting the baud rate

Connecting the Cables

Connect the HomeBase to the host computer or other device by plugging an RS-232 serial cable into the RS-232 Communications Port on the rear of the HomeBase. The

wiring of your cable depends on whether the other device is set up as a DCE (Data Communications Equipment) or DTE (Data Terminal Equipment) device.

The HomeBase RS-232 Port is configured as a DCE device. To communicate with a DTE device such as a computer, use a standard (or straight-through) RS-232 cable. To communicate with a DCE device, use either a null modem adapter in line with a standard RS-232 cable, or a null-modem serial cable.

You can make your own cables by following the pin configuration in the chart below. To do so, you must determine if your host RS-232 device is 9-pin or 25-pin, and whether it is configured as a DCE or DTE device.

HomeBase /Host Port (DCE)	IBM AT DB9 (DTE)	IBM XT DB25 (DTE)	Modem DB25 (DCE)
2 (RD)	2	3	2
3 (TD)	3	2	3
5 (SG)	5	7	7
4 (DTR)	4	20	6
6 (DSR)	6	6	20
7 (RTS)	7	4	5
8 (CTS)	8	5	4

Figure 16 Pin Configuration

With the Dolphin 7200 HomeBase, use the appropriate cable to connect each device to the Main Comm Port for a single Dolphin HomeBase or to the Multi-HomeBase Port if you are creating a Dolphin HomeBase network.

Connect the power supply to the Dolphin HomeBase. Plug the AC transformer into the Dolphin HomeBase 12 Volt DC power supply connector. The AC wall transformer provided can power only one Dolphin HomeBase.

Hand Held Products recommends that you leave the Dolphin HomeBase connected to its power source at all times, so that it is always ready to use.

Setting the Configuration Switches

Use these switches to select the network and communications modes for your Dolphin HomeBase. If you are configuring the HomeBase for a single Dolphin Terminal, the switch must be in the 'Single' position for proper basic operation. The switch must be set to 'Multi' for proper network operation if you are creating a HomeBase network. The configuration switch must be in the program position to change the baud rate.

Setting the Baud Rate

You may use the HomeBase Configuration utility program to select the baud rate. The program can also be used to change the host system's COM port and will run a diagnostic check for optimal communications. After changing the baud rate, you must power the HomeBase off and then on again. The program is one of the utility programs that come with the Dolphin OS and Development System. For more on HomeBase Configuration, see the chapter 8.

Modes of Operation

Through the Command Mode, the host application software provides command instructions for configuring a single Dolphin HomeBase or a network of HomeBases for communications. Once configured, the HomeBase(s) is in Transparent Mode and ready for communications.

Command Mode

You can configure a single Dolphin HomeBase or a whole network and select units for communications via the host application by entering the Command Mode. Data transmission is not possible while the Dolphin HomeBase network is in this mode. Go into Command Mode by entering an escape sequence that informs the HomeBase network that it will be receiving commands from the host device or application. The escape string is:

<ESC>HHP

where **<ESC>** is an ASCII 27 character. The escape string should be surrounded by a 100 millisecond period of line silence. When sending commands, the escape string must precede the command string. The HomeBase automatically exits Command Mode after receiving each command.

Programming commands used for configuring single Dolphin HomeBases include Version Number and Baud Rate Selection. You configure HomeBase networks using the Baud Rate Selection, Address Assignment and Device Selection programming commands. See the sections on *Configuring A Single Dolphin HomeBase* and *Creating a HomeBase Network* for details.

Transparent Mode

When the Dolphin HomeBase is selected by the host application and ready for communications, it is in Transparent Mode. In this mode, the HomeBase facilitates point-to-point communication between the host device and the Dolphin Terminal. Data sent through the RS-232 link is passed directly to and from the Dolphin Terminal via the Infrared Link between the terminal and the HomeBase.

NOTE

The configuration switches are checked at power up. Changes in the switch settings will not be recognized until power is turned off and then back on.

Configuring a Single Dolphin 7200 HomeBase

To prepare a single Dolphin HomeBase for communications, you must enter the Command Mode to configure the version number and select the baud rate.

Version Number

To configure the version number for the Dolphin HomeBase:

1. Enter or send the escape and command strings:

<ESC>HHPV

This command will return the version number but is not needed for communications.

Baud Rate Selection

The Dolphin HomeBase baud rate is set to 57600 at the factory. Use the configuration switches on the HomeBase's back panel to select the network and communications modes for your Dolphin. The following table outlines the configuration switch settings:

Switch	Setting	Function
1	SINGLE (UP)	Single HomeBase only
2	FIXED BPS (DOWN)	Baud rate fixed at 57600
2	PROGRAM (UP)	Baud rate can be programmed

Figure 17 Configuration Switch Settings on HomeBase for Single HomeBase

To ensure communications, leave Switch 2 in the 'FIXED BPS' position and configure your communications software for 57600 baud. When Switch 2 is in the 'PROGRAM' position, the baud rate can be changed using the following procedure or you may use the HomeBase Configuration Utility program.

1. Enter or send the escape and command strings:

<ESC>HHPB*n*

where *n* is the ASCII number corresponding to the baud rate shown in the table below. For example, the string <ESC>HHPB6 (which consists of the escape string and the command B6) would set the baud rate for the network to 19200. No response will be transmitted back to the host after executing this function.

NOTE

The baud rate is stored in Non-Volatile Memory and is retained even if the power is removed from the network.

ASCII Value of "n"	Selected Baud Rate	ASCII Value of "n"	Selected Baud Rate
0	38400	6	19200
1	38400	7	38400
2	1200	8	57600
3	2400	9	115200
5	9600		

Figure 18 Baud Rate per Value of *n*

Creating a Dolphin 7200 HomeBase Network

This information applies only to the Dolphin 7200 HomeBase. The Dolphin 7200 Compact HomeBase **is not** networkable. Each HomeBase must have its own AC power adapter connected to a standard AC electrical socket. The group can be placed on a table or desk, or rail-mounted using the mounting holes on the two outside Dolphin HomeBase units.

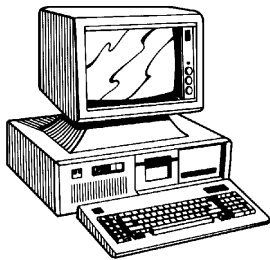
How to Daisy Chain the Dolphin HomeBases

To form a HomeBase network, daisy chain the HomeBases together using one of the following methods:

- Align adjacent units so that the MULTI-HOMEBASE PORT of one unit will mate with the MAIN COMM PORT of the next unit until all HomeBases in the network are connected.

OR

- Use a RS-232 cable to connect the Multi-HomeBase Port on one terminal to the MAIN COMM PORT on the next terminal. Repeat this step to include each additional terminal in the chain. Connect the last terminal to the host computer and leave the last MULTI-HOMEBASE PORT open if it is not needed.



Programming Commands

To configure a Dolphin HomeBase network, these attributes must be programmed: Address Assignment, Baud Rate Selection and Device Selection.

Address Assignment

Use the Address Assignment command to establish unit IDs for each Dolphin HomeBase in your network. This must be done before a unit can be selected for communications. To establish an Address Assignment:

1. Type or send the escape and command strings to set-up the configuration mode and establish the beginning unit ID number:

<ESC>HHPCI n

n is the number representing the first unit in the network

For example, the string <ESC>HHPCI0 would instruct the network to set up ID numbers for all the units in the network beginning at zero (0).

NOTE

The configuration switches are checked at power up. Changes in the switch settings will not be recognized until power is turned off and back on.

2. The first Dolphin HomeBase in the network receiving the command responds to the host with:

<SYN>

<SYN> indicates that the command was accepted

3. In sequence, each Dolphin HomeBase will determine its own ID number by adding one to the previous ID number.

4. When ID numbers are established for all HomeBases, the last HomeBase will return this response to the host:

<ACK> n

<ACK> indicates completion of ID configuration; n represents the ID number for the last unit in the network.

Programmer's Note: When sending ID numbers to the Dolphin HomeBase, remember that numbers typed on the keyboard are ASCII numbers which will be converted to Hex when sent to the Dolphin HomeBase. For example, typing the command from the keyboard:

<ESC>HHPCI1

would instruct the network to set up ID numbers for each Dolphin HomeBase starting with the ASCII number 1. The first unit in the network would actually receive the number 31 Hex (since ASCII 1 is equal to 31 Hex) as the starting ID number. Each unit in the network would sequentially add one to this starting ID number to establish its own ID. So, for a network of 15 units, the final ID number would be set up as 3F Hex. When the final unit sends back an <ACK>3F, the host computer (which converts Hex data back to ASCII) will then display the ID number as "?" instead of 15 as you might expect.

Baud Rate Selection

The Dolphin HomeBase baud rate is preset to 57600 at the factory. Use the configuration switches on the back panel of the HomeBase to select the network and communications modes for your Dolphin. The following table outlines the configuration switch settings:

Switch	Setting	Function
2	FIXED BPS (DOWN)	Baud rate fixed at 57600
2	PROGRAM (UP)	Baud rate can be programmed

Figure 19 Configuration Switch Settings for a HomeBase Network

When Switch 2 is in the 'PROGRAM' position, the baud rate can be changed using the following procedure or by using the HomeBase Configuration Utility.

Enter or send the escape and command strings:

<ESC>HHPBn

n is the ASCII number corresponding to the baud rate shown in the table below. For example, the string <ESC>HHPB6 (which consists of the escape string and the command B6) would set the baud rate for the network to 19200. No response will be transmitted back to the host after executing this function.

ASCII Value of "n"	Selected Baud Rate	ASCII Value of "n"	Selected Baud Rate
0	38400	6	19200
1	38400	7	38400
2	1200	8	57600
3	2400	9	115200
5	9600		

Figure 20 Baud Rate per Value of *n*

NOTE

The baud rate is stored in Non-Volatile Memory and is retained even if the power is removed from the network.

Device Selection

Use this command to enable the host device to select a specific Dolphin HomeBase in the network for communication.

1. Enter or send the escape and command strings:

<ESC>HHPSn

where *n* is the unit ID of the Dolphin HomeBase being selected

2. The Dolphin HomeBase with the unit ID corresponding to the ID number in the Device Selection command string will respond with:

<ACK>n

to indicate to the host that it is present. *N* is the unit ID.

When data transfer begins, the COMM LED on the Dolphin HomeBase will blink red and green. A unit remains selected until another unit in the network is selected. For example, the string <ESC>HHPS3 would select the unit with ID number 3 for communications. That unit would then send back an <ACK>3.

A selected unit in the Dolphin HomeBase network will assert the DSR signal of the HomeBase when a Dolphin terminal is present. The DSR signal can be used by the host application to determine if a Dolphin terminal is present and selected.

Communicating with the Dolphin Terminal

To communicate with the Dolphin and any other devices connected to the HomeBase:

1. Insert the Dolphin into the terminal well of the HomeBase. If the Dolphin is in sleep mode, it will awaken into active state.
2. The CHARGING MAINBATT LED on the HomeBase will turn on. If the Dolphin does not turn on, or the LED does not light up, make sure that it is properly seated in the terminal well and that the power supply is properly connected to the HomeBase and plugged into a functioning AC outlet.
3. Start your application on the Dolphin terminal or the host computer. Data can then begin transmitting between the terminal and the devices connected to the Dolphin HomeBase.



When data transfer begins, the COMM LED on the Dolphin HomeBase will blink red and green. If the HomeBase will not communicate with the Dolphin, check the port connections to ensure that the HomeBase is correctly configured. See *Chapter 9, Troubleshooting*, for more information.

Chapter 8 Using the Dolphin 7200 Compact HomeBase

Summarizes the features of the Dolphin 7200 Compact HomeBase and explains how to use it.

Hub of the System

As the hub of your Dolphin system, the Dolphin 7200 Compact HomeBase performs three important functions – battery management, communications and storage.

Battery Management

The Dolphin 7200 Compact HomeBase uses a charging method that senses when the battery pack is fully charged and then drops to a trickle charge to keep the battery pack at full capacity. The battery pack does not need to be discharged before recharging because this method protects the battery from damage caused by overcharging.

The Dolphin 7200 Compact HomeBase provides power to the Dolphin terminal to enable the terminal to charge its battery.

IrDA Optical Communications

The IR communications port on the Compact HomeBase connects with the IrDA port on the Dolphin. Reliable data communications at speeds of up to 115 baud can be transmitted by the HomeBase. With no pins or contacts to break, IrDA will work reliably for years.

The Dolphin 7200 Compact HomeBase **is not** networkable.

Convenient Storage

The Dolphin 7200 Compact HomeBase is a safe and convenient storage receptacle for the Dolphin terminal.

Dolphin 7200 Compact HomeBase Parts and Functions

Front Panel

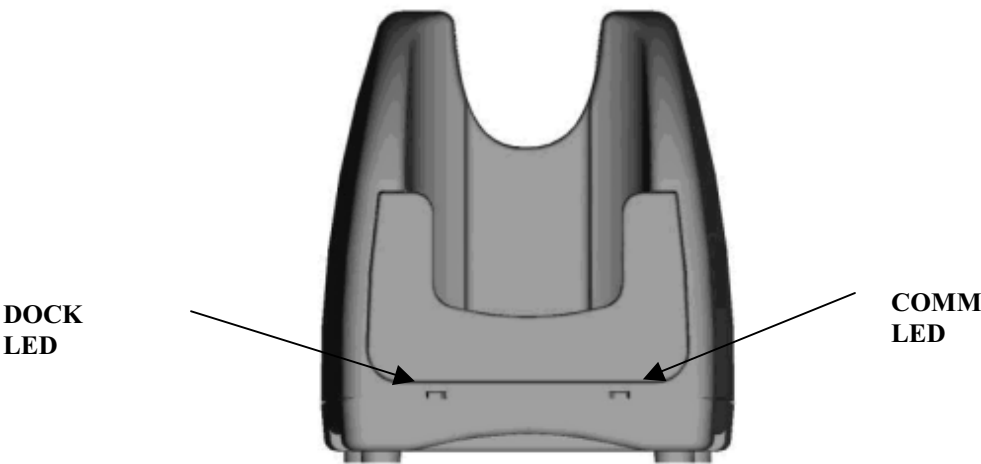


Figure 16 Front View of HomeBase

The Compact HomeBase’s front panel has one slot:

Dolphin Terminal Well You put the Dolphin in this well to communicate with a host device and to charge the Dolphin’s batteries.

LEDs There are two LEDs on the front panel of the HomeBase

1. **DOCK LED** Turns solid green when the Dolphin Terminal is properly seated into the Dolphin HomeBase.
2. **COMM LED** Indicates the status of data transfer between the Host Device and the Dolphin Terminal as described below:

Comm LED	Description
Red LED	Data is being sent from the Host Device to the Dolphin HomeBase.
Green LED	Data is being sent from the Dolphin HomeBase to the Host Device.
Orange LED	Data is being sent at high data rates.

Back Panel

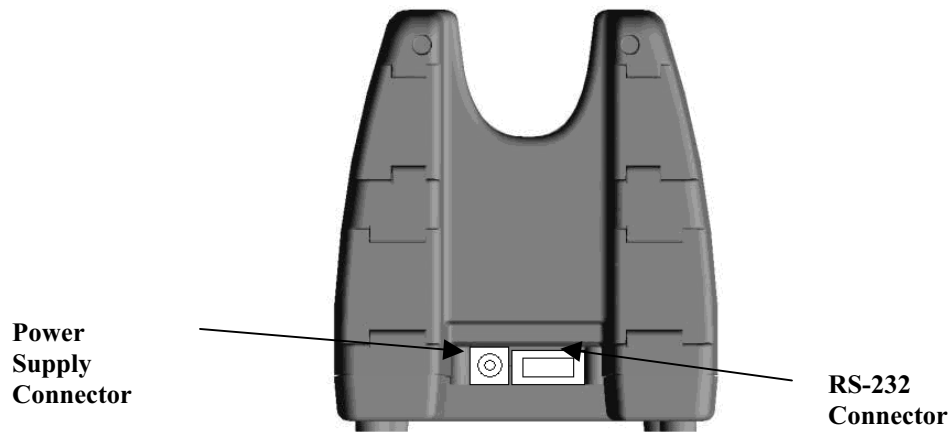


Figure 17 HomeBase Back Panel

There is a power supply connector and an RS232 connector:

Power supply connector Use this connector to attach a power supply to the HomeBase. The power supply provides 12V DC input for communications and battery charging.

RS-232 Communications Port Use a standard serial cable to connect this port to a host RS-232 device.

Bottom Panel

A Baud Rate DIP switch is located on the bottom of the HomeBase. The three-position DIP switch is used to select the communication baud rate. Switch position and the corresponding baud rates are shown in the chart below.

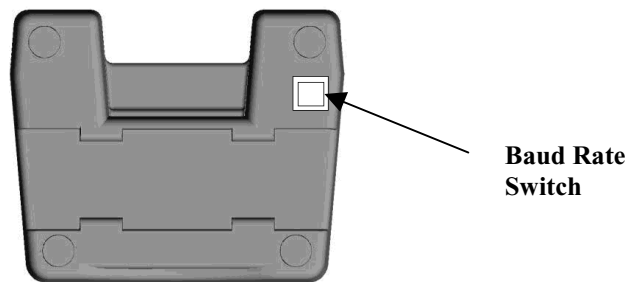


Figure 18 HomeBase Bottom Panel

NOTE

*The HomeBase Configuration program **cannot** be used to select the baud rate on the Compact HomeBase.*

Baud Rate	Switch 1	Switch 2	Switch 3
115200	0	0	0
57600	1	0	0
19200	0	1	0
9600	1	1	0
38400	0	0	1
4800	1	0	1
2400	0	1	1

*Note: The HomeBase Configuration program **cannot** be used to select the baud rate on the Compact HomeBase.*

Powering the Dolphin Terminal

When seated in the HomeBase, the Dolphin terminal receives the power it needs to charge the battery and to run its internal circuitry.

The Dolphin terminal can be stored indefinitely in the HomeBase without damage to the terminal or the HomeBase. Keep the HomeBase plugged in so that the Dolphin terminal's battery pack stays fully charged.

Charging A Dolphin Terminal

The HomeBase supplies charging power to the Dolphin terminal so that the terminal can monitor the charging of its battery pack. This charging method protects the battery from being damaged by overcharging. Therefore, the Dolphin terminal may be stored indefinitely in the HomeBase without damage to the terminal, the battery pack, or the HomeBase.

To charge a Dolphin terminal, follow these steps:

1. Insert a battery pack into the Dolphin terminal.
2. Place the terminal, laser engine window up and the LCD visible, in the Dolphin Terminal Well of the Dolphin HomeBase.
3. Let it glide down into the well until it stops.

4. Once the Dolphin terminal is properly seated, the Dock LED on the HomeBase will be solid GREEN.



Figure 19 Inserting the Dolphin terminal into the HomeBase



Figure 20 Dolphin Seated in HomeBase

Deep-Cycling Batteries

For maximum battery life, Hand Held Products recommends that you deep-cycle (service) the battery **twice** before initial use and then, once a month thereafter. Since the Dolphin 7200 Compact HomeBase ***does not*** have deep-cycling capabilities, it is recommended that you use the Dolphin 7200 Multicharger or the Dolphin 7200 HomeBase.

The deep-cycling process using the Multicharger takes approximately 9.5 hours. For more information, see the Dolphin 7200 Multicharger User's Guide.

Mounting the Dolphin 7200 Compact HomeBase

The Dolphin 7200 Compact HomeBase may be desk or wall-mounted for convenience and storage.

Desk Mounting:

The Compact HomeBase has a DIN rail (7.5 X 35 mm) slot on the bottom to allow for secure desk attachment of the unit if desired (see figure 21).

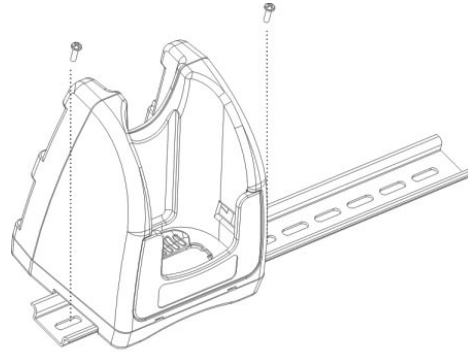


Figure 21

Wall Mounting:

The Compact HomeBase also has two DIN rail (7.5 X 35mm) slots on the back to allow for secure wall mounting of the unit if desired (see figure 22).

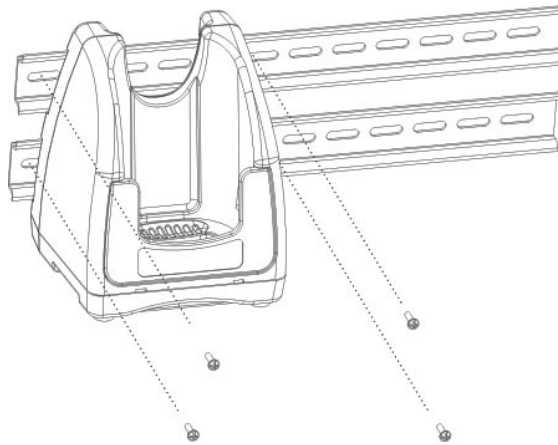


Figure 22

When using right-angle style RS232 connector cable, the DIN rails may be mounted directly to the wall. When using standard RS232 connector cables, it is recommended that the rails be mounted to the wall using a 25mm (1 in.) spacer to allow for appropriate strain relief of the cables (see figure 23).

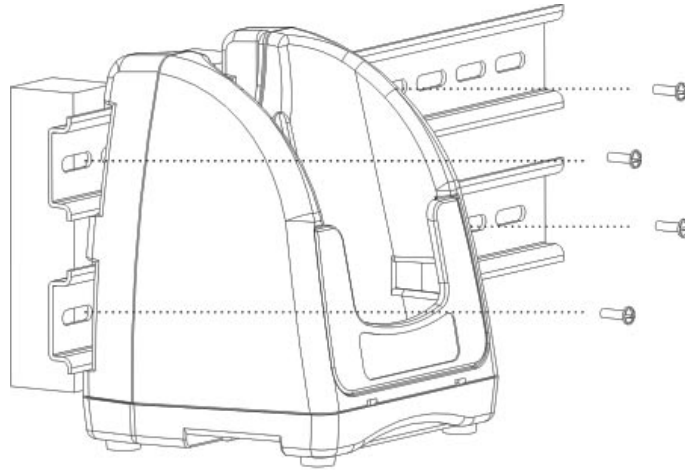
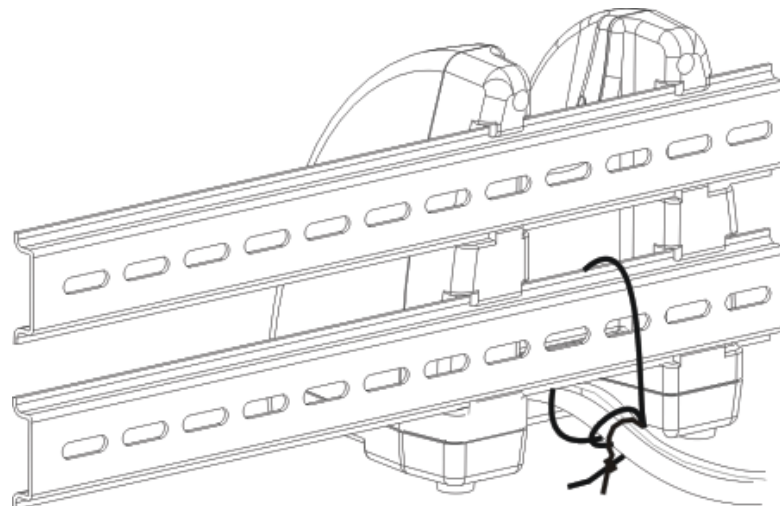


Figure 23

In either case, **after wall mounting**, it is **recommended** that the cables be secured to the DIN rail through use of a wire tie to prevent damage to the Compact HomeBase unit in case accidental or excessive force is applied to the cables. (see figure 24)



SECURE THE PROTRUDING
WIRES TO THE DIN RAIL WITH
A WIRE TIE OR EQUIVALENT.

Figure 24

Setting Up For Communications

The Dolphin terminal and Dolphin Compact HomeBase support RS-232 communications through the RS-232 Main Communications Port on the back of the Dolphin 7200 Compact HomeBase. The HomeBase translates the RS-232 signals from the host computer into infrared signals to communicate with the Dolphin Terminal.

The HomeBase RS-232 interface allows the Dolphin terminal to communicate to a personal computer, modem, or any standard RS-232 device using a standard serial cable and communications software.

Follow these steps to set up the Dolphin HomeBase and Dolphin Terminal for communications:

1. Set up the Dolphin Compact HomeBase.
2. Set-up the Dolphin Terminal.
3. Follow the data transfer sequence as described by your application.

Setting up the Dolphin Compact HomeBase

Set the Dolphin Compact HomeBase on any dry, stable surface such as a desktop. Before mounting the Compact HomeBase, check to ensure that all AC wall transformers have a nearby electrical outlet. Be sure to provide enough workspace with good lighting for the user to view and operate the Dolphin Terminal while it is in the HomeBase.

Connecting the Cables

Connect the Compact HomeBase to the host computer or other device by plugging an RS-232 serial cable into the RS-232 Communications Port on the rear of the HomeBase. The wiring of your cable depends on whether the other device is set up as a DCE (Data Communications Equipment) or DTE (Data Terminal Equipment) device.

The HomeBase RS-232 Port is configured as a DCE device. To communicate with a DTE device such as a computer, use a standard (or straight-through) RS-232 cable. To communicate with a DCE device, use either a null modem adapter in line with a standard RS-232 cable, or a null-modem serial cable.

You can make your own cables by following the pin configuration in the chart below. To do so, you must determine if your host RS-232 device is 9-pin or 25-pin, and whether it is configured as a DCE or DTE device.

HomeBase /Host Port (DCE)	IBM AT DB9 (DTE)	IBM XT DB25 (DTE)	Modem DB25 (DCE)
2 (RD)	2	3	2
3 (TD)	3	2	3
5 (SG)	5	7	7
4 (DTR)	4	20	6
6 (DSR)	6	6	20
7 (RTS)	7	4	5
8 (CTS)	8	5	4

Figure 16 Pin Configuration

With the Dolphin 7200 Compact HomeBase, connect each device to the RS-232 Communications Port on the back of the HomeBase. The Compact HomeBase **cannot** be networked.

Connect the power supply to the Compact HomeBase. Plug the AC transformer into the Dolphin HomeBase 12 Volt DC power supply connector. The AC wall transformer provided can power only one Dolphin Compact HomeBase.

Hand Held Products recommends that you leave the Dolphin Compact HomeBase connected to its power source at all times, so that it is always ready to use.

Communicating with the Dolphin Terminal

To communicate with the Dolphin and any other devices connected to the Compact HomeBase:

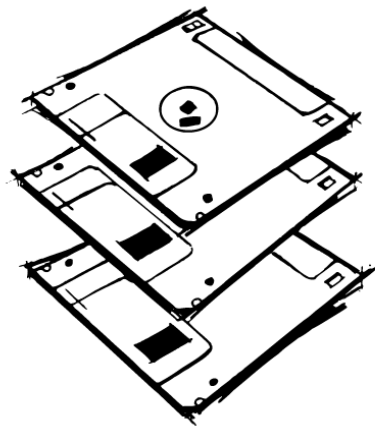
1. Insert the Dolphin into the terminal well of the HomeBase. If the Dolphin is in sleep mode, it will awaken into active state.
2. The CHARGING MAINBATT LED on the HomeBase will turn on. If the Dolphin does not turn on, or the LED does not light up, make sure that it is properly seated in the terminal well and that the power supply is properly connected to the HomeBase and plugged into a functioning AC outlet.
3. Start your application on the Dolphin terminal or the host computer. Data can then begin transmitting between the terminal and the devices connected to the Dolphin HomeBase.



When data transfer begins, the COMM LED on the Dolphin HomeBase will blink red and green. If the HomeBase will not communicate with the Dolphin, check the port connections to ensure that the HomeBase is correctly configured. See *Chapter 10, Troubleshooting*, for more information.

Chapter 9 Learning About the Dolphin OS and Development System Software

*Explains how to use and manage the software accompanying the Dolphin
7200 terminal.*



Dolphin OS and Development System

Important Notice: Before installing the Dolphin OS and Development System it is important that you remove all previous installations. To remove the previous installations, delete the c:\dolphin directory and all files contained within. You should also delete the Dolphin Group or Folder. Only install the most recent release of the Dolphin ROM IMAGE and Boot Loader, loading an old version of the ROM IMAGE or Boot loader can result in Dolphin becoming unstable or inoperable, and requiring the unit to be returned to HHP for repair.

Your Dolphin terminal comes with a set of diskettes containing the Dolphin OS and Development System. The Dolphin OS and Development System includes the following:

- Dolphin Development Tools and Libraries (API)
- Sample Programs with source code
- Dolphin Utilities including Communication and Upgrade Wizard
- Electronic Help
- Boot Loader & ROM Image

Installation

The Dolphin OS and Development System installs easily using a standard Windows installation utility. To install:

1. Start Microsoft Windows and Close/Exit any active Windows Applications.
2. Insert the Dolphin OS and Development System diskette #1 into drive A: or drive B:.
3. In Windows 3.1, select File | Run from Program Manager, or, from Windows 95, select Start | Run.
4. Type **a:\setup** (or **b:\setup**) and press <ENTER>.
5. Follow the instructions on the screen to complete the installation and setup procedure. The setup program will create the following directories on your system:

Directory	Contents
c:\dolphin\	Default installation directory, containing HHP Help and Read Me First Files.
C:\dolphin\bootldr	Backup of Dolphin Boot Loader (BURN.EXE and BOOTLDR.BIN)
c:\dolphin\devtools	Dolphin Development Libraries, Samples and API Help file.
C:\dolphin\wizard	Dolphin Upgrade Wizard
c:\dolphin\hhpdemo	HHP Dolphin Batch Demo Program
c:\dolphin\romimage	Backup of Dolphin ROM Image
c:\dolphin\utils	Dolphin Utilities (YX.EXE, DCOMM.EXE, BMP2LCD.EXE)
c:\dolphin\devtools\samples\rfdemo\server	Host/Server application
c:\dolphin\devtools\samples\rfdemo\client	Client application for Dolphin RF

Note: All future references to directories assume that the user has accepted the installation default directory. The default installation directory is “c:\dolphin”.

Figure 21 Directories Created by Dolphin OS & Development System Set-up Program

Help File, Document and Utility Icons

The Dolphin OS and Development System set up program will set up a Dolphin group or folder and install the following Help, Document and Utility icons.



Read Me First

The Read Me First Icon provides important information not available at the time the manual was printed.



**Contacting
HHP**

The Contacting HHP Icon provides information on contacting HHP by Phone, Fax, Email, WWW and BBS.



**OS and
Development
System**

The OS and Development System Icon provides additional information on the Dolphin OS and Development System.



Dolphin API

The Development Library Help file provides information on the Dolphin API and Sample applications.



Dolphin Help

Electronic Users Guide for the Dolphin terminal.



**Dolphin File
Transfer**

A Windows drag-and-drop communication utility, supporting Xmodem and Ymodem file transfer protocols



**Dolphin
Upgrade Wizard**

A Windows utility that steps you through the process of upgrading Dolphin's Boot Loader, ROM image and Demo application.



**HomeBase
Configuration**

A Windows utility for configuring the HomeBase baud rate.

Dolphin HHP Demo Program

A simple demonstration program is included with the Dolphin OS and Development System that shows how the Dolphin terminal works. The Dolphin OS and Development system setup program installs the demonstration programs in the **c:\dolphin\hhpdemo** directory on your PC.

The HHP demo has also been pre-installed on your Dolphin terminal. If you need to re-install the HHP demo, copy all the files located in the **c:\dolphin\hhpdemo** directory to your Dolphin terminal's C: drive or run the Dolphin Upgrade Wizard.

Main Menu

The HHP Demo Program is loaded automatically when the Dolphin terminal is turned on. To turn the Dolphin terminal on, press the ON/SCAN key. When you first turn the Dolphin terminal on, an HHP logo and a dolphin graphic are displayed. Press any key and the following prompt should appear on the display:



HHP Demo Main Menu

Note: If the screen illustrated above does not appear on your Dolphin terminal, the HHP Demo Application has been removed from your terminal.

F1 – Scan Demo

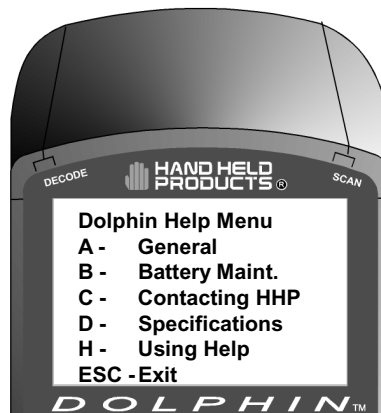
Press F1 to load the Scan program. Documented source code for the Scan demo program is included on the Dolphin OS and Development System disk.



HHP Scan Demo Screen

F2 – Help Menu

Press F2 to access the Help Menu. The Help Menu contains information about the Dolphin terminal, Specifications and contacting Hand Held Products.



HHP Help Menu

F3 –HHP DEMO

Press F3 to load the HHP Inventory Control sample program. This application uses a lookup table to validate item numbers and display part descriptions. The data entered is written to a file, and can be transferred via Xmodem to a computer.



HHP Demo Main Screen

F1 – Enter Data

Press F1 to display enter or scan data. If the item number is found, the item description is displayed. If the item number is not found, the program will ask the user if the item should be added. The date is automatically entered.



F1 Enter Data Screen

F2– Transfer Data

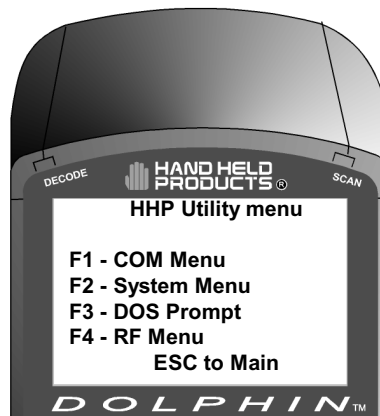
Press F2 to transfer the collected data to a desktop computer. The data is transferred using standard Xmodem protocol.

F3– Receive Lookup

Press F3 to initiate Xmodem receive. A new Lookup table can be transferred to the terminal.

F4- Scan Set-up**F4 – Utility Menu**

Press F4 to load the Utility Menu. The Utilities Menu has four options as described below:



HHP Utility Menu

F1 –COM Menu

Press **F1** to Send File from the Dolphin terminal to a host system (PC) via the Ymodem protocol at 57600 baud rate. Press **F2** to Receive File sent from a host system via the Ymodem protocol at 57600 baud rate.

F2 – System Menu

Gives version of operating system, serial number of your Dolphin and access to miscellaneous utilities

F3 – DOS Prompt

Press F3 to exit the HHP demo and return to the DOS prompt.

F4 RF Menu (For Dolphin RF only)

Press F4 to access the RF menu. Press F1 for RF Setup and F2 for Ping.

Scanning A Barcode

The Dolphin Terminal comes with demonstration software that allows you to scan barcodes immediately. A sample barcode is illustrated below for you to use for practice.



Hold the Dolphin terminal approximately 2 inches away from the sample barcode. Press the ON/SCAN key to begin scanning. Move the Dolphin terminal back and forward until the unit gets a good read. The Dolphin terminal will “beep,” and the laser will turn off when a good read is obtained. The decode LED will turn green

The Dolphin terminal will show a translation of the sample barcode on the LCD window, which should appear similar to the following illustration.



Dolphin Utilities

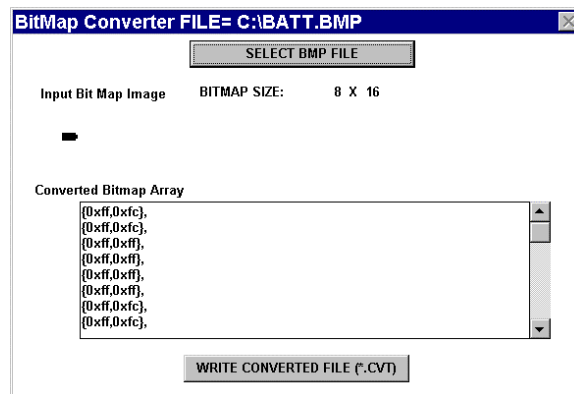
A number of utilities are provided with your Dolphin terminal. The Utility programs are installed in the `c:\dolphin\utils` directory on your computer.

NOTE

See the Development API electronic Help file (dolphapi.hlp) for additional information regarding the Dolphin Development Libraries, samples and compiling instructions.

BMP2LCD.EXE

BMP2LCD.EXE is a Windows tool that allows developers to create a bitmap data structure from a standard Windows™ bitmap. The bitmap can then be displayed using a Dolphin Developers API function such as `evDrawUserBitMap()`.



BURN.EXE

BURN.EXE is a Dolphin utility, which will load or reload the Dolphin's Boot Loader. The Boot Loader is an Xmodem communications utility used by the Dolphin OS to load or update the BIOS and Operating System (ROM image). To load or reload the Dolphin's Boot Loader:

1. Transfer BURN.EXE and BOOTLDR.BIN to the Dolphin's FLASH Drive C:.
2. Execute BURN.EXE. The OS Boot Loader is updated and the files BURN.EXE and BOOTLDR.BIN are deleted.

WARNING

Only install the most recent release of the Dolphin Boot Loader, loading an old version of the Boot loader can result in Dolphin becoming inoperable, and requiring the unit to be returned to HHP for repair.

DCOMM.EXE

DCOMM.EXE is a Windows communication utility. It supports drag-and-drop file transfer using both Ymodem and Xmodem.

Usage :

dcomm [/c#] [/b#] [/y] [/x] [filename1...n]

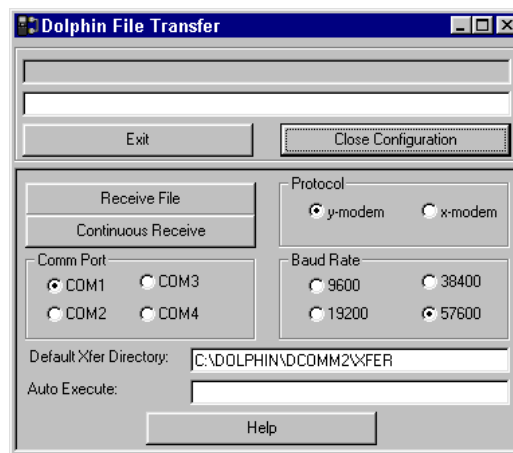
Where:

<i>/c#</i>	<i>Specifies COM port, where # = 1-4</i>
<i>/b#</i>	<i>Specifies Baud Rate, where # = 9600, 19200, 38400 or 57600</i>
<i>/x</i>	<i>Specifies Xmodem protocol</i>
<i>/y</i>	<i>Specifies Ymodem protocol</i>
<i>/a</i>	<i>Automatic mode, waits and receives all files that are sent</i>
<i>filename</i>	<i>Filename to transfer, supports multiple file names and wildcards (*.dat).</i>

Example:

dcomm /c1 /b57600 /y filename.dat

If you do not specify command line arguments, DCOMM.EXE will open a dialog that allows you to receive files or configure the default serial communications port, baud rate, communications protocol and download path.

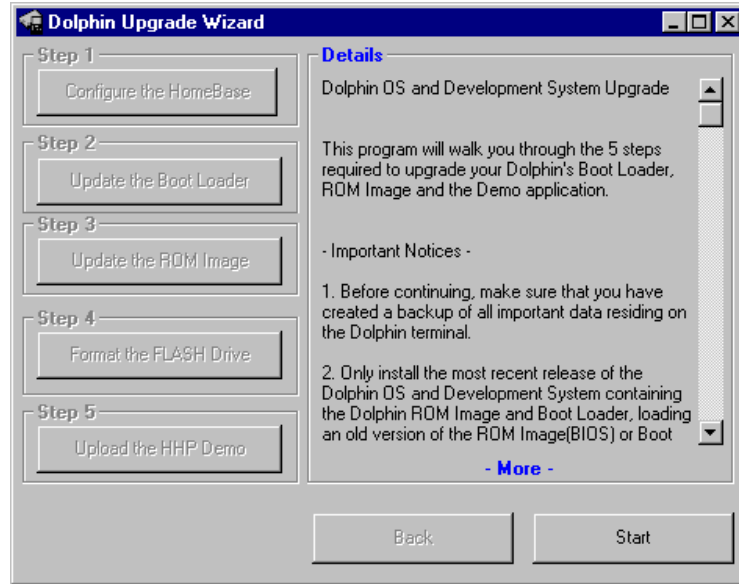


An 'Auto Execute' command line can also be specified in the configuration screen. The specified command line will be executed when a file is received.

DWIZARD.EXE

DWIZARD.EXE is a Windows utility that steps you through the process of upgrading Dolphin's Boot Loader, ROM image and Demo application. Simply run DWIZARD and follow the instructions provided to:

- Upgrade the terminal Boot Loader
- Upgrade the terminal ROM Image (BIOS, A Drive Image)
- Reinstall/Upgrade the HHP Demo



HBCFG.EXE

HBCFG.EXE is a Windows utility that allows the user to change the baud rate setting for the Dolphin HomeBase. HBCFG.EXE supports the following command line arguments:

Usage:

hbcfg [/c#] [/I] [/b#]

Where:

/c#: Specifies COM port, where #=1-4

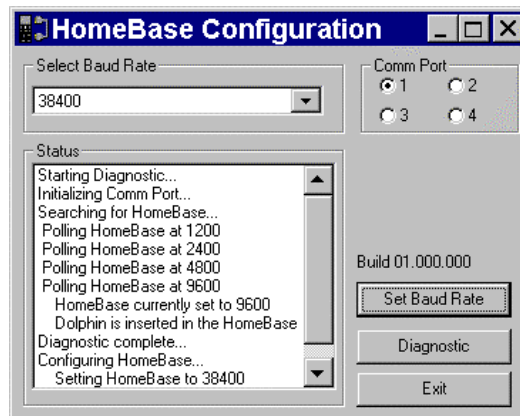
/b#: Specifies Baud Rate, where #=9600, 19200, 38400 or 57600

/I: Forces HBCFG.EXE to display 'Please wait Dialog'

Example:

hbcfg /c1 /b57600 /I

If no command line arguments are specified or an error is detected, HBCFG.EXE will open a dialog that allows the user to select the serial communications port, baud rate, or run a diagnostic.



Note: Dip Switch 2 located on the back of the HomeBase must be set in the Up (PROGRAM) position for the baud rate to be programmed. The HomeBase power must be cycled (turned off and on) for the new dip switch settings to be recognized.

LOADER.EXE

LOADER.EXE is a DOS Xmodem utility used to load or reload the Dolphin terminal's ROM Image. LOADER.EXE supports the following command line arguments:

Usage:

loader filename [-p# -b#]

Where:

filename: refers to file name to load

-p#: Specifies new COM port, 1-2

-b#: Specifies new BAUD rate, 300-38400

Example:

`LOADER C:\DOLPHIN\BIOS\ROM262.BIN -p1 -b57600`

STL.EXE

STL.EXE is a DOS command line utility for Dolphin that turns the 9th line status indicators on or off.

Usage:

STL [1] [0]

Where:

1: Turns the status line on

0: turns the status line off

Example:

`STL 1`

If no command line is specified, STL.EXE will toggle the status line off, if it was on, and on if it was off.

YX.EXE

YX.EXE is a DOS command line Ymodem communication tool for the Dolphin terminal or a PC. YX.EXE supports the following options:

NOTE

When using YX on the Dolphin 7200 terminal, only COM1 is available.

Usage:

`yx {/c#} [/b#] [/m] [filename]`

Where:

filename: refers to file name to send, if not specified YX will receive a file
/c#: Specifies COM ports 1-4
/b#: Specifies new BAUD rate, 300-57600
/m: Run YX in menu driven mode

Examples:

`yx /b57600 autoexec.bat`
`yx`
`yx /m`
`yx /c2`

The default baud rate for the YX.EXE utility is 57600. For your convenience, batch files are included on the Dolphin terminal to make sending data at a higher baud rate easier.

To send at 38400, enter <YF> instead of YX/b38400.

To send at 57600, enter <YFF> instead of YX/b57600.

ZZZ.EXE

ZZZ.EXE is a DOS command line utility for Dolphin that places the terminal into sleep mode.

Note — The terminal can not be placed in sleep mode while it is in the HomeBase. While in a HomeBase, the terminal must be on so it can monitor the battery status.

The following Utilities are included in the Dolphin ROM image and are automatically loaded when the terminal boots. They are NOT included on the Dolphin OS and Development System Disk.

Utility	Description
EVS.EXE	Enhanced Video System (EVS) is a TSR that traps standard video BIOS (INT 10H) calls, and overlays hardware-specific support for the Dolphin's LCD. In addition, EVS provides application and system level Status line support.
POWERMON.EXE	POWERMON.EXE is a TSR that monitors battery status and power usage. POWERMON.EXE is automatically loaded when the terminal boots.

Dolphin Application Development

Compiling Applications for the Dolphin

Dolphin application development is straightforward. Since Dolphin is DOS-compatible, most of the application can be tested on a desktop computer.

Although Dolphin is DOS-compatible, it provides many unique features that are not built into most PCs. For example, it has an integrated bar code scanner. The Dolphin libraries provide an API that allows an application to use these features. There are four libraries provided for linking into applications:

- **dolphins.lib** for small memory models
- **dolphinm.lib** for medium memory models
- **dolphinc.lib** for compact memory models
- **dolphinl.lib** for large memory models

The header file, **dolphin.h**, in the **c:\dolphin\devtools** directory contains useful declarations for using these libraries.

Sample Applications

A number of sample programs with source code have been provided with your Dolphin terminal. The sample programs are installed in the `c:\dolphin\devtools\samples` directory on your desktop computer.

Application	Description
GRAPH	Draws various patterns on the Dolphin's LCD display.
KBSTATUS	Displays keystrokes. If the keystroke is non-printable, the hex value of the keystroke is displayed.
LED	Allows the red and green LEDs to be toggled
ONBHIT	Displays status of the ON key.
SCAN	Allows bar code scanning.
SIO	Performs serial I/O. Displays characters received and sends key strokes.
SOUND	Runs through the frequency range of the Dolphin's speaker.
NI	Sample programs for the Numeric Dolphin. This sample is located in the <code>C:\DOLPHIN\DEVTOOLS\NUMERIC\BORLAND</code> or <code>C:\DOLPHIN\DEVTOOLS\NUMERIC\MSVC</code> .
EVSDemo	Demonstrates graphics, changing fonts, turning the status line on and off, adding new icons to the status line, and changing the system cursor.
INV5	Sample inventory application with source code.

Building the Samples

There is one Microsoft Visual C/C++ version 1.52 project file, **.mak**, for each sample application. There is also a Borland C++ version 5.0 project file, **samples.ide**. This project file will rebuild all sample applications. Consult the documentation for your compiler for information on the use of project files.

Compiling the Sample Programs

***Note:** See the Development API Help file (DAPL.HLP) for complete information regarding the Dolphin Development Libraries, Samples and Compiling instructions.*

Microsoft

In order for an application to use Dolphin's unique features, you must add a Dolphin library to the *application's* project. There are four libraries located in **c:\dolphin\lib\msvc** named **dolphinx.lib** where **x** is **s**, **m**, **c**, or **l**, corresponding to the memory model.

To add **dolphinx.lib** to an application's project:

- Select the menus Project | Edit.
- Change List Files of Type: to Library (*.lib). Browse into **c:\dolphin\devtools\lib\msvc**. Select **dolphinx.lib** corresponding to the memory model. Click the Add button.
- The Include Files Path must be modified, so the compiler will search for include files in **c:\dolphin\devtools\include**.

Borland

For an application to use Dolphin's unique features, you must add a Dolphin library must be added to the application's project. There are five libraries are located in **c:\dolphin\devtools\lib\□ orland** directory. They are named **dolphinx.lib** where **x** is **t**, **s**, **m**, **c**, or **l**, corresponding to the memory model.

To add **dolphinx.lib** to an application's project:

- Right click on the .exe file in the Project Window.
- Select Add node from the pop-up menu.
- When the Add to Project List dialog box is displayed, change Files to Type: to Libraries (*.lib).
- Browse to **c:\dolphin\devtools\lib\□ orland**.
- Select the **dolphinx.lib** library corresponding to the memory model. Click the Open button.
- The Include Files Path must be modified, so the compiler will search for include files in **c:\dolphin\devtools\include**.

Transferring Files to or from Dolphin

Transferring files between your Dolphin terminal and a desktop PC is easy with the YX.EXE utility or the Dolphin File Transfer program.

Using the YX.EXE Utility

The YX.EXE utility, installed in the directory `c:\dolphin\utils`, performs RS-232 file transfers using Ymodem batch protocol. In addition, YX.EXE is preloaded on the Dolphin's A drive. This program can be run by entering commands at the DOS prompt or by accessing a menu.

NOTE

When using YX on the Dolphin 7200 terminal, only COM1 is available.

YX.EXE supports the following options:

Usage :

`yx [/b#] [/m] [filename] [com port]`

Where:

filename: refers to file name to send, if not specified YX will receive a file
/b#: Specifies new BAUD rate, 300-57600
/m: Run YX in menu driven mode
/c#: Specifies COM ports 1-9

Examples:

`yx /b57600 autoexec.bat`
`yx`
`yx /m`
`yx/c2`

The default baud rate for the YX.EXE utility is 57600. For your convenience, batch files are included on the Dolphin terminal to make sending data at a higher baud rate easier.

To send at 38400, enter <YF> instead of YX /b38400.

To send at 57600, enter <YFF> instead of YX /b57600.

Using the Dolphin File Transfer Program

Open the Dolphin program group in Windows Explorer and copy the Dolphin File Transfer shortcut to your PC's desktop. Putting the shortcut on your desktop will simplify the file transfer process.



NOTE

The configuration switches are checked at power up. Changes in the switch settings will not be recognized until power is cycled.

Sending a File to the Dolphin

1. Open the Dolphin File Transfer Program Configuration dialog box. Check to make sure the baud rate is set at 57600. This is the default for YX.EXE. Close the Configuration dialog box and exit the Dolphin File Transfer program. To change the baud rate, see the section on “*Sending Files at a Higher Rate*” on the next page.
2. Open Windows Explorer. Resize and move the window so that you can see both Explorer and the Dolphin File Transfer shortcut on your desktop.
3. In Windows Explorer, select the file to be transferred and, while holding down the left mouse button, drag and drop the file on the Dolphin File Transfer shortcut on the desktop. This opens the Dolphin File Transfer program.
4. At the Dolphin’s C: prompt, enter <YX>.
5. Press <ENTER> on the Dolphin terminal to begin the file transfer. The COMM LED on the Dolphin HomeBase will blink red and green during the transfer. You can also view the progress of the file transfer on the Dolphin screen and Dolphin File Transfer program window.

Sending a File From Dolphin to Your PC

1. Double-click on the Dolphin File Transfer shortcut to open the program.
2. Open the Configuration dialog box. Check to make ensure the baud rate is set at 57600.
3. At the Dolphin’s C: prompt, enter <YX> [Filename].
4. Click on the Receive File button.
5. Press <ENTER> on the Dolphin terminal to begin the file transfer. The COMM LED on the Dolphin HomeBase will blink red and green during the transfer. You can also view the progress of the file transfer on the Dolphin screen and in the Dolphin File Transfer program window.

Sending Files At A Higher Rate

A batch file containing command lines for sending and receiving files at higher baud rates is also loaded on the Dolphin terminal. To send at a higher rate, the Dolphin HomeBase must be programmed at the higher baud rate. Configuration Switch 2 should be in the down position. Refer to the section on *Baud Rate Selection in Configuring a Single Dolphin HomeBase* or *Creating a HomeBase Network* later in this chapter.

- To send at 38400 baud rate, enter <YF> at the DOS prompt instead of <YX>.
- To send at 57600 baud rate, enter <YFF> at the DOS prompt.

Using the Dolphin File Transfer Program and YX in Menu Mode

You can also use YX in menu mode to send and receive files from the Dolphin to your PC and vice versa with the Dolphin File Transfer program and YX.EXE on the PC.

Sending Files to the Dolphin

To use a menu for sending files to the Dolphin, follow these steps:

1. Open the Configuration dialog box. Check to make sure the baud rate is set at 57600. This is the default for YX.EXE.
2. Enter <YX /M> at the Dolphin terminal's DOS prompt.
3. Press <ENTER> and the menu below will appear on your Dolphin terminal's screen:



NOTE

When using the menu, press <F3> to change to a higher baud rate. Be sure to set Configuration Switch 2 in the up position.

4. In Windows Explorer, select the file to be transferred and, while holding down the left mouse button, drag and drop the file on the Dolphin File Transfer shortcut on the desktop. This opens the Dolphin File Transfer program.
5. Press <F2> to begin the file transfer. The COMM LED on the Dolphin HomeBase will blink red and green during the transfer. You can also view the progress of the file transfer on the Dolphin screen and status bar in the Dolphin File Transfer program window.

Sending Files From the Dolphin To Your PC

- 1.** Double-click on the Dolphin File Transfer shortcut to open the program.
- 2.** Open the Configuration dialog box. Check to make sure the baud rate is set at 57600.
- 3.** Enter <YX /M> at the Dolphin terminal's DOS prompt.
- 4.** Press <ENTER> and the menu below will appear on your Dolphin terminal's screen:
- 5.** Click on the Receive File button.
- 6.** Press <F1> on your Dolphin terminal and then enter the name of the file. Press <ENTER>. The COMM LED on the Dolphin HomeBase will blink red and green during the transfer. You can also view the progress of the file transfer on the Dolphin screen and status bar in the Dolphin File Transfer program window.

Dolphin EVS Engine

The EVS engine provides bit-mapped graphics support for the Dolphin LCD. EVS is the primary interface between an application and BIOS graphics functions. The EVS engine consists of three basic parts:

- 1.** A TSR (EVS.EXE) that traps standard video BIOS (INT 10H) calls, and overlays hardware specific support for the Dolphin LCD.
- 2.** A set of API routines that allow easy access to the EVS specific routines. These functions have been merged into the standard Dolphin Development API and are documented in the Dolphin API Help file (DAPI.HLP).
- 3.** Application and system level Status line support.

The EVS engine eliminates the need for an application to directly access the hardware layer. The EVS engine maintains an image of the display in memory (118 pixels wide by 73 pixels tall). All application screen access (read/write) is filtered so as to write to the display image rather to the hardware. The EVS engine then updates the hardware (e.g. writes to the display) as necessary. This process allows for support of a single display plane that combines graphics and text.

For more on the Dolphin EVS Engine, see the Dolphin OS and Development System electronic help file.

Dolphin ROM Image and Boot Loader

Upgrading the Dolphin ROM Image

Important Notice: Before installing the Dolphin OS and Development System, you must remove all previous installations. To do this, delete the C:\DOLPHIN directory and all files contained within as well as the Dolphin Group or Folder. Only install the most recent release of the Dolphin ROM IMAGE and Boot Loader. Loading an old version of the ROM IMAGE or Boot Loader can make the Dolphin unstable or inoperable, and requiring you to return the unit to HHP for repair.

The Dolphin terminal has a Boot Loader incorporated that allows the developer to upgrade or reload the ROM IMAGE.

Follow these steps to manually reload the ROM IMAGE and Operating System from DOS:

1. Verify that Configuration Switch 2 on the back of the Dolphin HomeBase is set to “Fixed BPS” and Switch 1 is set to “Single”. Power must be turned off and then on to accept the new dip switch settings.
2. Make sure the serial cable is properly installed and power is properly connected to the HomeBase. Make sure no other communications programs are running on the PC.
3. Start the Dolphin Boot Loader. Hold down the “7” and “9” keys with one hand. With your other hand, press and release the “ON/SCAN”, “SHIFT” and “BKSP” keys. Release the “7” and “9” keys. You should see the screen below. If not, repeat step three.



4. Press “3” to select Baud rate. Press “1” to set baud rate to 57600.



5. Press 1 to download.

Upgrading the Dolphin Boot Loader

Note: We recommend that you use the Dolphin Upgrade WIZARD to update the Dolphin Boot Loader, ROM image and Demo application. Simply run DWIZARD and follow the instructions provided.

WARNING

Only install the most recent release of the Dolphin ROM IMAGE and Boot Loader.

DO NOT load an old version of the ROM IMAGE or Bootloader.

The Dolphin may become unstable or inoperable requiring you to return the unit to HHP for repair.

While it is unlikely that you will ever need to reload the Dolphin Boot Loader, an image of the Dolphin Boot Loader is included with the Dolphin OS and Development System just in case. The Boot Loader image is installed in the **c:\dolphin\BootLDR** directory on your PC.

To load or reload Dolphin's Boot Loader:

1. Transfer BURN.EXE and BOOTLDR.BIN to Dolphin's FLASH Drive C:.
2. Execute BURN.EXE. The OS Boot Loader is updated and the files BURN.EXE and BOOTLDR.BIN are deleted.

Chapter 10 Troubleshooting and Warranty Information Dolphin 7200 Terminal

Describes troubleshooting tips, solutions for problems you may encounter with the Dolphin 7200 terminal or HomeBase and warranty information.

Just In Case

The Dolphin 7200 terminal and Dolphin HomeBase are both designed to provide years of trouble-free use. Both products are covered by a one-year limited warranty. This chapter includes troubleshooting tips, warranty information, describes how to obtain technical support.

Before Calling For Technical Support

If you have problems with either the Dolphin terminal or HomeBase, review the list of symptoms and solutions included in this chapter. If the problem isn't listed in this chapter, contact your Reseller or Hand Held Products' Technical Support Department for assistance.

Troubleshooting the Dolphin Terminal and HomeBase

This table describes some of the common problems/symptoms and solutions that you could encounter while using your Dolphin terminal or Dolphin HomeBase. If you need further assistance with troubleshooting your terminal, contact your HHP Authorized Reseller.

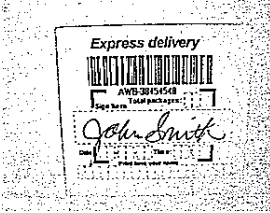


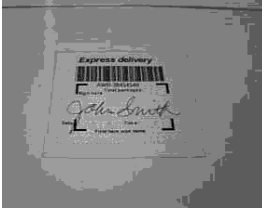
If You Have This Problem/Symptom	Try This:
The display is blank, the Dolphin terminal will not turn on.	Is the battery is low? Recharge or replace it with a known good battery. Reset the Dolphin terminal.
When booting up the Dolphin, I see the message 'CMOS MEM size wrong' for a second or two and the unit continues to boot. Is there something wrong with my unit?	When the Dolphin's internal NiMH battery is not charged or run down, this message will display and the terminal's settings are reset to their default values. This includes the date and time which is reset to January 1, 1980 and 12:00 AM. The terminal is fine. You simply need to recharge the internal battery and reset the Dolphin's date and time. To do this, insert a fully charged battery in the Dolphin and then use the DOS Date and Time function to set the correct date and time. The internal back-up battery requires a minimum of 5 hours of charging time in order to perform and maintain the system as described in Chapter 2 of this manual.

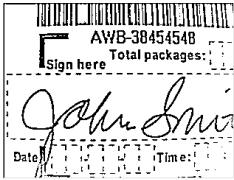
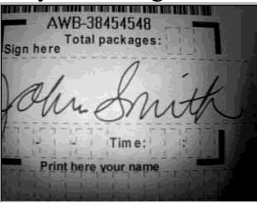
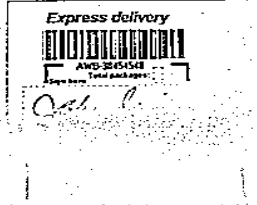

If You Have This Problem/Symptom	Try This:
The Dolphin terminal will not scan a bar code.	<p>The bar code may be out of spec. Try reading some of the bar code examples in Appendix C, or locate a bar code sample that you know can be read by another Dolphin terminal.</p> <p>Is the exit window dirty? Clean it with a soft dry cloth. If the exit window is badly scratched, the Dolphin terminal should be returned to HHP for repair.</p> <p>Consult your software developer to ensure the correct bar code symbology is being used.</p>
The battery in the Dolphin terminal keeps failing.	<p>If the battery has been stored for a long period of time, it may take three charge/discharge cycles before the battery reaches its full storage capacity.</p> <p>The capacity of NiMH batteries decreases as the number of charge/discharge cycles increases. So, if you are experiencing low run times, a new battery may be required.</p> <p>To increase the run time of the Dolphin terminal, try to limit the use of the speaker, scan engine and backlight.</p>
The Dolphin terminal is not communicating with the host computer.	<p>Make sure the HomeBase is connected to a power source.</p> <p>Make sure the Dolphin terminal is inserted properly into the HomeBase. The CHARGING MAINBATT LED should be solid green. If not, remove the Dolphin terminal and reinsert it into the HomeBase.</p> <p>Ensure the communications baud rate is set correctly. Set communications for 57600, N, 8, 1. Make sure that Configuration Switch 2 on the back of the HomeBase is set to "Fixed BPS".</p> <p>Make sure the RS-232 cable is properly attached to the HomeBase and host computer. Also, check to ensure that the cable is configured properly.</p>
I can not enter a ":" to change to Drive B: at the DOS prompt.	<p>The ":" is a special character that can be entered by typing "SHIFT" "Z". See reference to special characters in "Using the Alphanumeric Keypad" or "Using the Numeric Keypad" section for additional information.</p>
The 'CHARGING AUXBATT' LED does not come on when I insert a battery pack into the Dolphin HomeBase.	<p>Check the power connections on the Dolphin HomeBase. Also check to ensure the battery pack is properly seated.</p>

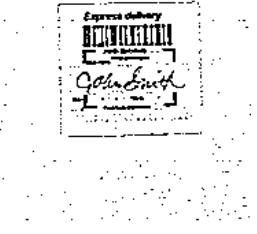

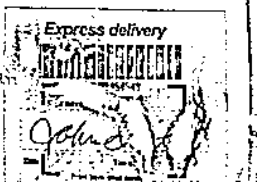

**CHAPTER 10 TROUBLESHOOTING AND WARRANTY
INFORMATION FOR DOLPHIN 7200 TERMINAL**

If You Have This Problem/Symptom	Try This:
The 'CHARGING AUXBATT' LED constantly changes from RED to ORANGE to GREEN.	The NiMH battery pack may need to be replaced. Insert a new battery pack into the Dolphin HomeBase's auxiliary battery well.
The 'CHARGING MAIN BATT' LED is on, but the Dolphin terminal will not communicate.	<p>Check the cable connections to other devices. If you are connecting to another DCE device, be sure you're using a null modem cable. Try a previously tested cable if you suspect a bad cable.</p> <p>Check your communications program in both the Dolphin terminal and the RS-232 device with which you are communicating. Verify that the baud rates are set properly.</p>

Troubleshooting with Dolphin 7200 with Image-Capture

If You Have This Problem/Symptom	Try This:
<p>Image not readable or too dark <i>Black & White Image:</i></p>  <p><i>Grayscale Image:</i></p> 	<p>Move to an area with more light to take image.</p>
<p>Image not readable, distorted <i>Black & White Image:</i></p>  <p><i>Grayscale Image:</i></p> 	<p>Hold Dolphin with Image-Capture terminal at 90 degree angle.</p>

If You Have This Problem/Symptom	Try This:
<p>Image not readable, cut off</p> <p>Black and White Image:</p>  <p>Grayscale Image:</p> 	<p>You are holding terminal too close to subject. Hold the terminal at a 90 degree angle and move it further away from the subject.</p>
<p>Image not readable, dirty lens</p> <p>Black and White Image:</p>  <p>Grayscale Image:</p> 	<p>Wipe lens with clean, lint free cloth.</p>

If You Have This Problem/Symptom	Try This:
<p>Image not readable; too small.</p> <p><i>Black and White Image:</i></p>  <p><i>Grayscale Image:</i></p> 	<p>You are holding the terminal too far away from the subject. Hold the terminal at a 90 degree angle and move it closer to the subject.</p>
<p>Image not readable due to reflection</p> <p><i>Black and White Image:</i></p>  <p><i>Grayscale Image:</i></p> 	<p>Adjust the angle at which you are holding the Dolphin terminal to avoid a reflection.</p>

Resetting The Dolphin Terminal

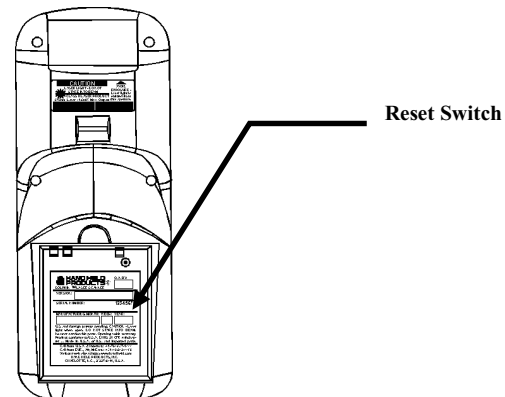
Under normal circumstances, you should not need to reset the Dolphin terminal. However, if required, you can reset the terminal with one of the following methods:

1. Perform the “Three Key Reset.”

The Dolphin terminal can be reset by pressing and releasing the “SHIFT”, “ON/SCAN” and “BKSP” keys. All three keys must be held down and released at the same time.

2. Press the Reset Switch.

The reset switch is located in the battery compartment of the Dolphin terminal.



Use the tip of an unfolded paper clip (or other similar blunt object) to gently press the reset switch.

Note: The recess hole for the reset switch may be covered with a small plastic cover. This cover must be removed and placed back in position after accessing the reset switch.

3. Remove the Main Battery.

If the methods described above are not successful, the Dolphin terminal may be reset by removing the main battery for an extended period of time. The terminal will reset when the Dolphin’s internal backup battery is completely drained of power. This process may take up to 5 hours.

Warranty Information

Who Is Covered By The Warranty

The Dolphin 7200 terminals and HomeBases offered by Hand Held Products, Inc. (HHP) are covered –by at least a one-year limited warranty. (See table below for the configuration of Dolphin 7200 you have purchased) Hand Held Products, Inc. extends this warranty only to the first end-user of the product. This warranty is non-transferable.

Product	Standard Factory Warranty
Dolphin 7200 Batch Laser	1 year
Dolphin 7200 RF Laser	1 year
Dolphin 7200 Batch iButton	1 year
Dolphin 7200 Batch Image Capture	1 year
Dolphin 7200 Batch 2-D	2 years
Standard HomeBase	1 year
Compact HomeBase	1 year

What's Covered By The Warranty

This warranty covers the Dolphin terminal and HomeBase and warrants them to be free from defects in materials and workmanship, under normal use and service, for a period of one year (two years for 2-D terminal) from date of purchase by the first end-user.

THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND FREEDOM FROM INFRINGEMENT. Neither HHP nor its marketing agents shall be liable for any direct, indirect, consequential, or incidental damages resulting from the use, results of use, or inability to use this product.

No one is authorized to change, add to, or otherwise alter this Warranty without the express written permission of an officer of HHP.

What's Not Covered By The Warranty

This Warranty does not cover software, or damage to the product caused by modification, alteration, misapplication, misuse of, or physical abuse to the product; or damage due to repair or service to the product by anyone other than an Authorized HHP Service Center. This Warranty also excludes any damage to the product caused by circumstances outside of HHP's control, such as, but not limited to, lightning or fluctuation in electrical power.

NOTE

You must have an RMA number to receive service on your product at the repair facility for North and South, Asia and the Pacific Rim.

How Problems Should Be Handled

Should the Dolphin terminal or HomeBase prove to be defective within the warranty period, return the product, as described in the RMA procedures below, and we will, at our option, repair or replace the product, to whatever extent HHP deems necessary to restore the product to proper operating condition, without any charge to you.

Return Information

If you purchased the product from an Authorized Hand Held Products Reseller, contact the Reseller with the unit's serial number. Your Reseller will contact Hand Held, on your behalf, to arrange for the unit to be serviced.

If you purchased the product directly from Hand Held, or have been instructed by your Reseller to contact Hand Held directly, call the Customer Services Department in your area to request a Repair Maintenance Authorization (RMA) number. *Note: An RMA number is not needed for service at the Europe, the Middle East, Africa or United Kingdom repair facilities.*

North and South America, Asia, Pacific Rim:

(TEL)+1-(704)-537-1444

(FAX)+1-(704)-566-9904

Europe, Middle East and Africa:

(TEL)+ 31-40 24 24 486

(FAX)+ 31-40 24 25 672

The United Kingdom :

(TEL)+44 (0) 1925 240055

(FAX)+44 (0) 1925 631280

You must have an RMA number to receive service from the repair facility for North and South America, Asia and the Pacific Rim. Failure to obtain an RMA number before shipping your product to this repair facility may result in the product being returned without being serviced. RMA numbers are valid for 30 days within the United States and 60 days Internationally.

When calling for service at any of our repair facilities, please be prepared to give the following information:

- Product's type and serial number
- Brief description of problem
- Dated Proof-of-Purchase

Place the product in its original packaging with a copy of your original invoice and ship the product prepaid to the appropriate address below:

North and South America, Asia, Pacific Rim

Hand Held Products
Product Service Department
7510 East Independence Blvd., #100
Charlotte, NC 28227-9411
RMA Number: _____

Europe, Middle East and Africa :

HHP Product Service Department
Hondsruglaan 87D
5628 DB Eindhoven
The Netherlands

The United Kingdom :

HHP Product Service Department
1st Floor
Dallam Court
Dallam Lane
Warrington, Cheshire WA2 7LT
United Kingdom

If your equipment is still covered under the initial end-user's product warranty, please notify the Customer Services Representative when you call. Please include a copy of the original invoice in the package to avoid possible service delays. For your protection, we recommend you insure any equipment being sent to HHP.

After repair or replacement of the equipment, Hand Held Products will ship the product, at our cost, to your location. Non-warranty repairs will be returned, at the customer's expense, unless otherwise requested. Units currently under a service agreement will be shipped per the service agreement.



Please make note of the RMA number (if required) before shipping and the product's serial number for future reference.

How To Extend Your Warranty

Hand Held Products offers a variety of extended service plans on our hardware products. These agreements offer continued coverage for your equipment after the initial warranty expires. For more information, contact HHP or your Authorized Reseller.

Technical Support

If you have a question or problem with your Dolphin terminal or Dolphin HomeBase, you can get technical assistance from Hand Held's Technical Support department.

Technical Support – North and South America, Asia and Pacific Rim:

(TEL) +1-(704) 537-1444

(FAX) +1-(704) 532-4191

8:30 a.m. and 5:30 p.m., Eastern Time, Monday through Friday

Technical Support – Europe, Middle East and Africa :

(TEL)+31-40 24 24 486

(FAX)+31-40 24 25 672

9 a.m. – 5 p.m., Central European Time, Monday through Friday

Technical Support – The United Kingdom :

Tel : INT+ 44 1925 240055

Fax : INT+ 44 1925 631280

9 a.m. – 5 p.m., UK Time, Monday through Friday

Appendix A Dolphin 7200 Terminal Specifications

Product	Dolphin 7200	Dolphin 7200 RF	Dolphin 7200 with Image-Capture	Dolphin 7200 with iButton Reader	Dolphin 7200 2D
Terminal Specifications					
Case Material	Polycarbonate ABS Blend, Splash-resistant, one-piece module	Same	Same	Same	Same
Dimensions	Length: 6.85 in. (17 cm) Width: 2.63 in. (7 cm) Depth at handle: 1.62 in. (4 cm) Depth at front: 1.83 in. (5 cm)	Length: 6.85 in. (without antenna) (17 cm) Width: 2.63 in. (7 cm) Depth at handle: 1.62 in. (4 cm) Depth at front: 2.25 in. (5 cm)	Length: 6.85 in. (174 mm) Width: 2.63 in. (7 cm) Depth at handle: 1.62 in. (41 mm) Depth at front: 2.25 in. (5 cm)	Length: 7.1 in. Width: 2.63 in. (7 cm) Depth at handle: 1.62 in. (4 cm) Depth at front: 1.83 in. (5 cm)	Length: 6.85 in. (17 cm) Width: 2.63 in. (7 cm) Depth at handle: 1.62 in. (4 cm) Depth at front: 2.25 in. (5 cm)
Ergonomics	Patented shape one-handed operation; fits either hand comfortably	Same	Same	Same	Same

Product Family	Dolphin 7200	Dolphin 7200 RF	Dolphin 7200 with Image-Capture	Dolphin 7200 with iButton Reader	Dolphin 7200 2D
Terminal Specifications (con't.)					
Weight (including battery)	12 oz (340 gm)	14.5 oz (411 gm)	14.1 oz. (400 gm)	14 oz (397 gm)	14.3 oz. (406 gm)
Display	8 lines of 20 characters per line, 119 x 73 graphics pixels, Alpha-Numeric, scrollable, Application software controllable pixel graphics, 6 x 8 pixel matrix, Electroluminescent Backlight	Same	Same	Same	Same
Keypad	Alphanumeric keypad—36 keys; Numeric keyboard-20 keys with shifted alpha keys	Alphanumeric keypad—36 keys; Numeric keyboard-20 keys with shifted alpha keys; Terminal emulation keypad overlays for IBM 3270, IBM 5250 & DEC VT220	Same as Dolphin 7200	Same as Dolphin 7200	Same as Dolphin 7200
Communication Interface	Optical IRDA optical, max 115kbs	Same	Same	Same	Same

Product	Dolphin 7200	Dolphin 7200 RF	Dolphin 7200 with Image-Capture	Dolphin 7200 with iButton Reader	Dolphin 7200 2D
Terminal Specifications (con't.)					
Visual Indicators	Red light is on during "Laser Scanning." Green light blinks when "Successful decode"	Same	Same	Same	Same
Audio Indicators	Internal application software controllable speaker, emits sound level of 80 dB at 10 cm.	External application software controllable speaker, emits sound level of 90 dB at 10 cm.	Same as Dolphin 7200 RF	Same as Dolphin 7200	Same as Dolphin 7200 RF
Power Specifications					
Primary	Rechargeable 3.6V 3 cell battery pack @ 1,500 mAh Length: 2.2 in. (5.6 cm) Width: 1.8 in. (4.6 cm) Depth: .08 (2 cm)	Same	Same	Same	Same
Backup	Internal NiHM Back-up battery retains memory & clock for up to 30 minutes	Same	Same	Same	Same
Power Management	Low-battery detection & automatic shut-off with battery voltage levels.	Same	Same	Same	Same

Product	Dolphin 7200	Dolphin 7200 RF	Dolphin 7200 with Image-Capture	Dolphin 7200 with iButton Reader	Dolphin 7200 2D
Processing Specifications					
CPU	AMD ELAN SC310 386SX microprocessor	Same	Same	Same	Same
Memory	2 MB RAM with 2 MB non-volatile FLASH memory expandable to 4, 6, or 10 MB	2 MB RAM with 2 MB non-volatile FLASH memory or 2 MB RAM with 8 MB non-volatile FLASH memory No expansion FLASH with radio.	Same as Dolphin 7200	Same as Dolphin 7200	2 MB RAM with 2 MB non-volatile FLASH memory expandable to 8 MB non-volatile flash

Product	Dolphin 7200	Dolphin 7200 RF	Dolphin 7200 with Image-Capture	Dolphin 7200 with iButton Reader	Dolphin 7200 2D
Processing Specifications (con't.)					
Real Time Clock	Accurate, crystal-controlled real time clock/ calendar Application software controllable time/date stamping	Same	Same	Same	Same
Operating System	GS-DOS architecture programmable with standard x86 development tools; Microsoft C/C++ libraries provided for non-PC standard functions (scan engine support, communication & power management)	Same	Same	Same	GS-DOS architecture programmable with standard x86 development tools; Microsoft C/C++ libraries provided for non-PC standard functions (image engine support, communication & power management)
Environmental Specifications					
Operating Temperature	-10 to 50°C (14 to 122°F); Operates at -20° for a short time with little loss of LCD quality	Same	Same	Same	-10 to 50°C (14 to 122°F);
Storage Temperature	-20 to 70°C (-4 to 158°F)	Same	Same	Same	Same
Humidity	Operates in up to 95% non-condensing humidity	Same	Same	Same	Same

Product	Dolphin 7200	Dolphin 7200 RF	Dolphin 7200 with Image-Capture	Dolphin 7200 with iButton Reader	Dolphin 7200 2D
Environmental Specifications					
Structural Integrity	Survives multiple 5 ft (1.5 m) drops to concrete Independently certified to meet IP-64 standards for moisture & particle resistance	Same	Same	Same	Same
Electrical Static Discharge	15KV	Same	Same	Same	Same
Fire Retardant Rating	UL 94-VO	Same	Same	Same	Same
2.4 GHz Specifications					
Radio		WLIF	802.11b		
		Integrated WLIF/OpenAIR	Integrated Cisco 802.11b		
Frequency		2.4 to 2.4835 GHz	2.4 to 2.4835 GHz		
Output Power		100mW	30mW		

Product	Dolphin 7200	Dolphin 7200 RF		Dolphin 7200 with Image-Capture	Dolphin 7200 with iButton Reader	Dolphin 7200 2D
2.4 Ghz Specifications (con't.)		WLIF	802.11b			
Data Rate		1.6 Mbps per channel in high-speed mode; 800 Kbps in back-off mode	1, 2, 5.5 and 11 Mbps			
Modulation		4FSK (BFSK in back off mode)	DBPSK at 1 Mbps; DQPSK at 2Mbps; CCK at 5.5 and 11 Mbps			
Typical Range		<500 ft (150 m) in offices, <1000 ft (300 m) in open spaces	1500 ft (460 m) open environment; 300 ft (90 m) office			

Product	Dolphin 7200	Dolphin 7200 RF		Dolphin 7200 with Image-Capture	Dolphin 7200 with iButton Reader	Dolphin 7200 2D
2.4 Ghz Specifications (con't.)		WLIF	802.11b			
Technology		Frequency Hopping Spread-Spectrum	Direct Sequence Spread Spectrum			
Channels		15 independent	3 non-overlapping			
Network Information		WLIF	802.11b			
Drivers		ODI supports major network operating systems	NDIS2, NDIS3, NDIS4, NDIS5 ODI, and Packet			
Media Access Protocol		Optimized CSMA/CA	Same			
Software		Standard TCP/IP Stack	Same			

Product	Dolphin 7200	Dolphin 7200 RF	Dolphin 7200 with Image-Capture	Dolphin 7200 with iButton Reader	Dolphin 7200 2D
Bar Code Specifications					
Standard scan engine	Symbol SE 1200-I000A, scans 2 - 36" (5 - 91 cm)	Same	Same	Same	
Optional scan engines	<p>Symbol SE1200LR, scans <15 ft (4.6 m) with reflective labels</p> <p>Symbol SE 1200VHD, scans bar codes <2 mil</p> <p>Symbol SE 1200HV, improved aiming beam visibility in high ambient light</p> <p>No Scan Engine (available with no scan engine)</p>	Same	Same	Same	
Bar code symbol types	Code 3 of 9, Interleaved 2 of 5, EAN, Codabar, Code 128, Plessey MSI, Code 11, Code 93, UPC	Same	Same	Same	Same

Product	Dolphin 7200	Dolphin 7200 RF	Dolphin 7200 with Image-Capture	Dolphin 7200 with iButton Reader	Dolphin 7200 2D
iButton Reader					
Communication Speed	-----	-----	-----	115.2kbps	
Product	Dolphin 7200	Dolphin 7200 RF	Dolphin 7200 with Image-Capture	Dolphin 7200 with iButton Reader	Dolphin 7200 2D
Digital Camera					
CMOS Camera	-----	-----	CMOS Sensor: 320 x 240 Pixel 3 to 12 in. (15 to 30.5 cm) operating range 256 level gray scale image Operates in range of light from outdoors to total darkness	-----	CMOS Sensor: 640 x 480 Pixel 2 to 9 in. (5 to 23 cm) operating range 256 level gray scale image Operates in range of light from outdoors to total darkness

Product	Dolphin 7200	Dolphin 7200 RF	Dolphin 7200 with Image-Capture	Dolphin 7200 with iButton Reader	Dolphin 7200 2D
4250 Image Engine					
Image Engine Options	----	----	----		<p>Standard: scans 2 to 9 in. (5 to 23cm) High-Density: scans 2 to 4 in. (5 to 12cm) Bar code and Auto-ID symbol types</p> <p>1D linear codes: Code 3 of 9, Interleaved 2 of 5, Code 11, IATA 2 of 5, MSI, UPC A, UPC EO, UPC EI, EAN/EAN13, Codabar, Code 128, Code 93</p> <p>2D codes: PDF417, microPDF, Maxicode, Datamatrix, Aztec, QR Code, Code 49</p>

Product	Dolphin 7200	Dolphin 7200 RF	Dolphin 7200 with Image-Capture	Dolphin 7200 with iButton Reader	Dolphin 7200 2D
4250 Image Engine					
Image Engine Options continued	-----	-----	-----	-----	Composite codes: RSS-14, CODABLOCK, AZTEC MESA OCR codes (Optical Character Recognition): OCR A and OCR B Postal Codes: Postnet and most international 4 state codes, PLANET CODE, BPO 4 STATE, CANADIAN 4 STATE, DUTCH POSTAL, AUSTRALIAN 4 STATE, JAPANESE POSTAL

Appendix B Bar Code Samples

With the HHP Demo program, the Dolphin terminal is programmed to read these codes. Practice scanning each of the bar codes, and notice the LCD window after you scan each code.

Code 39 (Code 3 of 9)



EAN (UPC variation)



UPC



Interleave 2 of 5 (I2of5)



Appendix C GS-DOS Commands

The Dolphin terminal ships with General Software DOS (GS-DOS). GS-DOS is compatible with Microsoft DOS (MS-DOS) and is optimized to run in a very small amount of memory.

The following is a list of internal commands supported by GS-DOS:

HELP	BREAK	CALL
CD (CHDIR)	CLS	COPY
CTTY	DATE	DEL (ERASE)
DELAY	DIR	ECHO
EXIT	FOR	GOTO
IFMD (MKDIR)	PATH	PAUSE
PROMPT	RD (RMDIR)	REM
REBOOT	REN	SHIFT
SET	SWITCH	SYNC
TIME	TRUENAME	TYPE
VER	VERIFY	VOL

The following section describe the internal GS DOS commands in detail.

Warning: The command line functions are intended for developers only. Some commands may produce undesirable results or may not function at all. In addition, the LCD may not display the command results properly.

HELP

The **HELP** command displays a list of the commands that are supported by the command interpreter.

Syntax: **HELP**

BREAK

The **BREAK** command changes or displays how GS DOS handles break-ins by the user with ^C and CTL-BRK key sequences. If BREAK is ON, then GS DOS will break out of a running program or batch file when the ^C or CTL-BRK keys are pressed. If BREAK is OFF, then GS DOS will not break out, but will instead pass the keys pressed to the program.

Syntax: **BREAK [ON|OFF]**

CALL

The **CALL** command executes a pre-recorded list of commands as a subroutine.

Syntax: **Call [d:] [pathname] [parameter1] [parameter2] [...]**

CD (CHDIR)

The **CD** command displays the current directory of the specified drive, or can change the current directory of the specified drive. If no drive is specified, then the default drive is used.

Syntax: **CD [drive:][pathname]**

CLS

The **CLS** command clears the terminal's screen and resets the cursor position to the upper-left hand corner of the screen. The next prompt is issued on the top line of the screen.

Syntax: **CLS**

COPY

The **COPY** command copies one or more files to a new destination. If the destination path names a file, then all of the source files are written to the target file, concatenated together.

Syntax: **COPY [drive:]pathname [drive:]pathname**

CTTY

The **CTTY** command changes the default console device

Syntax: **CTTY** *device*

Note: This command is not supported the Dolphin Terminal.

DATE

The **DATE** command displays the current date (month, day, date, and year) on the screen. If a user specifies a new date on the command line, then DATE will change the date to the one specified. This command updates the battery-maintained clock so that the new date will be remembered across power-downs.

Syntax: **DATE** *[mon-dd-yy]*

DEL (ERASE or ERA)

The **DEL** command deletes one or more files from a file system on a specific drive. If the specified path is a directory, all files in that directory will be deleted. If the path contains wildcards, then all files that match the wildcard specification will be deleted.

Syntax: **DEL** *[drive:]/pathname*

DELAY

The **DELAY** command delays a batch file for a specified amount of time.

Syntax: **DELAY** *seconds*

DIR

The **DIR** command displays the files and sub-directories in a directory on the specified drive. If the drive is not specified, then the default drive is assumed. DIR uses the path operand to determine which files to list. If the path is not specified, then the current directory is assumed. If the specified path is a directory name, then all files in that directory are listed. If the specified path is a wildcard filename, then all files matching the path specification are listed.

Syntax: **DIR** *[drive:]/[path] [wildcard-filename]*

ECHO

The **ECHO** command has two functions; namely, control of the ECHO flag, and displaying messages in batch files. ECHO mode controls the command processor's echoing of commands in batch files. If ECHO mode is on, then commands read from batch files are automatically echoed to the screen before they are executed. If ECHO mode is off, then commands are not echoed as they are executed. To display the current ECHO flag status, use the ECHO command without any parameters. To display a message from a batch file, use the ECHO command with a non-empty string to be displayed. The special form of the ECHO command with a period (".") immediately following the word ECHO (no intervening space) causes a blank line to be echoed.

*Syntax: **ECHO** [ON|OFF|string]*

EXIT

The **EXIT** command terminates the current command shell and reverts control to the previous shell, provided that the current command shell is not the first one loaded in the system. The very first shell cannot be terminated with EXIT. If executed from a batch file, EXIT will terminate the batch file in a controlled manner causing control to be transferred to the keyboard user.

*Syntax: **EXIT***

GOTO

The **GOTO** command causes the command processor to start executing commands that follow the specified label, in the current batch file. Labels can be inserted anywhere in batch files, and take the following form: "label".

*Syntax: **GOTO** label*

IF

The **IF** command causes a command to be executed if (or if NOT) a condition is TRUE.

*Syntax: **IF** [NOT] ERRORLEVEL n statement*

***IF** [NOT] EXIST filename statement*

MD (MKDIR)

The **MD** command creates a subdirectory in the root directory or a subdirectory. By using the MKDIR command, a tree-structured file systems can be created. If a drive is specified, then the directory is created on the specified drive. Otherwise, it is created on the default drive.

Syntax: **MD** [*drive:*]*path*

PATH

The **PATH** command displays or changes the current search path that is used by the command processor, COMMAND.COM, to locate user programs and batch files. If no pathlist parameter is specified, then the current path is displayed. If a pathlist parameter is specified, then the path will be changed to the one specified.

Syntax: **PATH** [*path1*;*path2*]*;*[*path3*]*;*...

PAUSE

The **PAUSE** command is typically used in batch files to suspend execution of the batch file, print a message on the screen, and wait for the user to press a key after some action has been performed. PAUSE displays the following message on the screen before accepting a keypress from the user, "Strike any key when ready".

Syntax: **PAUSE**

PROMPT

The **PROMPT** command maintains the PROMPT environment variable that is used by COMMAND.COM to display something before the user is asked to type-in a command.

The default PROMPT variable is \$n\$. This has the effect of showing the current drive letter followed by a "greater-than" sign:

Syntax: **PROMPT** *string*

RD (RMDIR)

The **RD** command removes a subdirectory from a root directory or of a subdirectory. This command can only be used to delete directories, and cannot be used to delete files, even if they are inside the directory to be removed. Conversely, the DEL command cannot delete directories; only the files they contain. If a drive is specified, then the directory on the specified drive is removed. Otherwise, the default drive is assumed.

Syntax: **RD** [*drive:*]*path*

REM

The **REM** command provides a simple way of entering a free-form comment in a batch file. The line starting with REM has no effect on the execution of the batch file.

Syntax: **REM** *any comment*

REBOOT

The **REBOOT** command will reset the terminal.

Syntax: **REBOOT**

REN

The **REN** command renames a file or group of files. Files cannot be moved in the directory structure with this command; instead, only their filenames are altered within the directory in which they reside. Wildcards may be used in the second pathname to indicate that the characters in that component of the first filename are to be kept as-is.

Syntax: **REN** [*drive:*]*/path/filespec filespec*

SHIFT

The **SHIFT** command allows access to multiple batch file arguments. The command shifts the contents of the 9 batch file arguments so that %2 is copied into %1, %3 is copied into %2 and so on.

Syntax: **SHIFT**

SET

The **SET** command displays the entire environment space (one variable per line), or changes the assignment of one variable in the environment space. If no operands are specified, then the SET command simply displays all of the environment variables in the environment space. If a variable name and an equal sign is given, but no string is specified, then the variable name is removed from the environment space. If the string is specified, then the previous definition of the variable is deleted, and the new one is installed in the environment.

Syntax: **SET** [*keyword*=[*string*]]

SHIFT

Displays or changes the optional switch character.

Syntax: **SWITCH** [*character*]

SYNC

The **SYNC** command provides a synchronization checkpoint feature that enables a batch file to flush the file system's buffers to disk before doing something that might otherwise cause a disorderly shutdown.

Syntax: **SYNC**

TIME

The **TIME** command displays or changes the system time. If no parameter is specified, then the current system time is displayed, and the user is queried for the new system time. If the user just presses the ENTER key, the system time is not changed. If the user enters a new time, then the system's real-time-clock is updated.

Syntax: **TIME** [*hh:mm:ss[.hh]*]

TRUENAME

The **TRUENAME** command displays the true name and path of a file.

Syntax: **TRUENAME** *file*

TYPE

The **TYPE** command copies the contents of the specified file to standard output (usually, the screen). If the drive letter is not specified, then the default drive is assumed.

Syntax: **TYPE** [*drive:*][*path*]*filespec*

VER

The **VER** command displays the MS-DOS emulation version number, as well as the version of the Embedded DOS-ROM operating system that is running.

Syntax: **VER**

VERIFY

The **VERIFY** command changes or displays how GS DOS handles I/O to disk files and directory structures. If VERIFY is ON, then Embedded DOS-ROM verifies immediately that disk I/O is completed successfully before telling the user that it was. This is accomplished by writing data directly to disk, without temporarily storing it in a file system or disk driver cache. If VERIFY is OFF, then GS DOS caches writes to files and defers the actual writing to disk, enabling multiple writes to the same sectors to be served much faster. The cache is automatically written to disk in the background during "dead time", when the disk is not busy. This is accomplished with the multitasking threads and semaphores that the GS DOS kernel supports.

Syntax: **VERIFY** *[ON|OFF]*

VOL

The **VOL** command displays the volume label of a diskette or a hard disk. VOL does not allow the user to change the volume label. If the drive letter is not specified, then the default drive is assumed.

Syntax: **VOL** *[drive:]*

Appendix D Declarations of Conformity

Declaration of Conformity

EC declaration of conformity for the following:

89/336/EEC EMC Directive

73/23/EEC Low Voltage Directive as amended by 93/68/EEC

1. Product Identification

Product name : Dolphin 1 Terminal and Homebase
Line of business : Auto ID
Model/type : N/A
Version : N/A
Additional information : This Product was tested with the following:
Dolphin 1 Terminal Bar Code Scanner
Dolphin 1 Homebase

2. Manufacturer

Name : Hand Held Products, Inc.
Address : 7510 E. Independence Blvd. #100
Charlotte, North Carolina 28227-9411
Country : United States Of America
Authorized by manufacturer : Corporate Body: Trading as:
Fleuri Kets V B.V. Hand Held Products Europe
Kaatsheuvel Hondsruglaan 87d
The Netherlands 5628 DB Eindhoven
The Netherlands

3. Test lab

Name : Instrument Specialties
Address : Delaware Water Gap, Pennsylvania 18327-0136
Country : United States of America

4. Applied standards

Name/numbers : ITE Emissions EN 55022
:Generic Immunity for Res./Comm./Lt. Ind. EN 50082-1
:Electrostatic Discharge Immunity IEC 1000-4-2
:Radiated EMI Field Immunity (IEC 801-3) IEC 1000-4-3
:Fast Transient / Burst Immunity IEC 1000-4-4

5. Test report

Name/number : ITE Emissions 45889
:Generic Immunity for Res./Comm./Lt. Industrial 45889
:Electrostatic Discharge Immunity 45889
:Radiated EMI Field Immunity (IEC 801-3) 45889
:Fast Transient / Burst Immunity 45889

6. Declaration

We, mentioned at point 2, declare on our own full responsibility that the product mentioned at point 1 complies with the directive 89/336/EEC. This is based upon testing of a sample of the product mentioned at point 1, performed by the test lab mentioned at point 3, according to the harmonized standards corresponding to article 10 (1) of the directive 89/336/EEC. These standards are mentioned at point 4. The results of the tests are given in the report mentioned at point 5.

7. Authentication

Signature in behalf of authorized
company mentioned at point 2 :

Signature On File

J.H. Cottrell Jr., Managing Director, Hand Held Products Europe

Date : _____ Place : _____

Declaration of Conformity

We, **Hand Held Products, a Welch Allyn Affiliate**

of **4619 Jordan Road, PO Box 187, Skaneateles Falls, NY 13153-0187, USA**

declare under our sole responsibility that the product

Dolphin® 7200 RF

to which this declaration relates, is in conformity with the following standards and/or other normative documents.

ETS 300 328 (November 1996)

ETS 300 826 (November 1997)

EN 60950: 1992 Incl Amdt 1-4, 11

We hereby declare that all essential radio test suites have been carried out and that the above named product is in conformity to all the essential requirements of Directive 1999/5/EC.

The conformity assessment procedure referred to in Article 10(5) and detailed in Annex IV of Directive 1999/5/EC has been followed with the involvement of the following Notified Body(ies):

BABT, Claremont House, 34 Molesey Road, Walton-on-Thames, KT12 4RQ

(name and address of Notified Body)

Identification mark:

0168

(Notified Body number)

The equipment will also carry the
Class 2 equipment identifier



The technical documentation relevant to the above equipment can be made available for inspection on application to:

Hand Held Products UK Ltd, Dallam Court, Dallam Lane, Warrington

Cheshire, WA2 7LT, UK

(name and address of EU representative)

Naveen Velagapudi

(name)

Product Qualification Manager

(signature of authorised person)

(date)

Declaration of Conformity
EC declaration of conformity for the following:
89/336/EEC EMC Directive
73/23/EEC Low Voltage Directive as amended by 93/68/EEC

1. Test Report

Name/Number	: Telefication	
	: ITE Emissions	98302120
	: Electromagnetic Immunity for Res./	
	Comm./Lt. Ind. (as listed above):	98302120
	: SGS	
	: LVD Compliance	U0212

2. Type Approval Certifications

Country/Approval Number	: FCC/USA	: HD5RFDolphin-1
	: Canada	: 16931021078A
	: Netherlands, UK, Austria	: NL98062970
	: Germany	: D800372K
	: Switzerland	: 98.0517.L.P
	: Denmark	: CEPT/RLAN/DK/9817
	: Norway	: CEPT/RLAN N NO98000529-R
	: Sweden	: Ue980117
	: Belgium	: RTT/RL/X070
	: Italy	: DGPGF/4/2/334473/2590/061098
	: Hungary	: 1705-2/99
	: Greece	: CEPT-RLAN-GR.YME TA 164
	: Ireland	: IRL TRA 24/5/242/1
	: Spain	: E/D.G.Tel./08/99/0221
	: France	: 980321PPO

3. Declaration

We, mentioned at point 2, declare on our own full responsibility that the product mentioned at point 1 complies with the directive 89/336/EEC and 73/23/EEC as amended by 93/68/EEC. This based upon testing of a sample of the product mentioned at point 1, performed by the test labs mentioned at point 3, according to the harmonized standards corresponding to article 10 (1) of the directive 89/336/EEC and to 73/23/EEC as amended by 93/68/EEC. These standards are mentioned at point 4. The results of the tests are given in the reports mentioned at point 5.

4. Authentication

Signature on behalf of authorized
Company mentioned at point 2:

Signature on file

J.H. Cottrell Jr., Managing Director, Hand Held Products, Europe

Date : October 27th, 1998

Place: North Carolina, USA

